PBL BUT NOT AS WE KNOW IT:
AN ETHNOGRAPHY OF THE PRACTICE AND FACILITATION OF 'PROBLEM-BASED LEARNING' WITHIN A HYBRID GRADUATE-ENTRY MEDICAL PROGRAMME IN ENGLAND

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Dedication

I dedicate this thesis to Katie Cowley, my amazing wife, who continually listened to me and supported me throughout this long journey; to my children, Owen and Sophia, whose smiles fuelled my perseverance; and, to Mom and Dad – Thank you for everything you have given me.

Abstract

This thesis lifts the lid on the educational practices within a medical education programme, which is based upon a Problem-Based Learning (PBL) approach. It is an ethnographic case study that sets out to understand the practice and facilitation of PBL situated within a hybrid curriculum at a graduate-entry medical programme in England. Data was collected by audio-visual recording of PBL sessions, audio recording and observing facilitator meetings and through the author's experiences as a participant observer working as a facilitator within the research setting.

The study exposes a variety of PBL practices within a single curriculum setting that have not previously been examined in detail within medical education, in particular through use of direct observational methods. The findings pose a challenge to a core educational objective, upon which the 'PBL' programme was founded, that being to develop students' skills as self-directed learners. While this is highlighted within the literature as a central component to the PBL process, the findings raise questions about how these assumptions are reflected in the practice of PBL.

Keywords: medical education, problem-based learning, facilitation, and ethnography

Acknowledgments

"I can't!" Moses exclaimed.
"Yes, you can," God told him,
"Because I will be there with you."

Exodus Chapter 3[1]

As I conducted and completed this research, God worked through a number of people to support me.

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Thank you to all of these people and to many others, who repeatedly told me, 'Yes, you can.' Your encouragement helped me to believe that I could.

[1] Reference: Batchelor, M and Boshoff, P. (2006) My first bedtime bible. Authentic Media: Singapore. Page 43.

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List of Abbreviations

BMI	Body Mass Index
CBM	Case Briefing Meeting
DAFNE	Dose Adjustment for Normal Eating
DoH	Department of Health
GEM	University of Nottingham Graduate Entry Medicine Programme
GMC	General Medical Council
HEFCE	Higher Education Funding Council for England
MWSAC	Medical Workforce Standing Advisory Committee
NHS	National Health Service
PBL	Problem-Based Learning
UK	United Kingdom

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Chapter 1: Introduction

1.1 A Peek into PBL . . .

We join this PBL group a few minutes before they start a new case. The time is nearly 11:00 a.m. on a Friday morning. The day started at 9:00 am. The group has already completed one session of PBL. Three men and two women all aged in their mid-twenties are having a break in the PBL room. One of the female students is sitting and typing on one of the two computer terminals situated on opposite sides of the room. The four other students are standing and leaning against chairs. One of the students is describing the upheaval caused when his housemate fell in love and unexpectedly decided to quit his work and move out of town. He was a monk not a medical student. The other students are laughing and probing for more details. The students are nearing the end of their first year in medical school.

The door opens and a male student enters carrying a packet of biscuits in his hand. He opens the packet and offers biscuits to the other students. At the far end of the room stands a circular table around which sit six blue chairs. The table is scattered with books, notepads, mugs and water bottles.

Four large whiteboards hang on the walls on either side of the room. They are covered with writing and diagrams written in green, blue, black and red coloured marker. The wall at the far end of the room is glass from floor to ceiling. A board rubber is propping the window open. Leftover Christmas decorations, two strands of yellow and red tinsel, are draped across the top of the window. Outside the windows, the sun is shining onto green leafy trees. It is June.

Moments later, another male student enters the room and turns on the kettle. A female student moves around the room wiping the whiteboards clean, but she leaves some diagrams untouched. Another student asks, 'Who wants a drink?' Orders are taken for coffee and tea. 'I'll have a decaf,' someone replies. The kettle boils and clicks. Steam temporarily fogs the lens of the video camera that is positioned above the kettle and is recording these activities.

As drinks are being made, the door opens, and the facilitator along with another female student enter the room. The facilitator is complimenting the student on her new hair colour. The facilitator puts a folder on the table and sits down with her back to the camera.

She looks around the room at the whiteboards and then asks, 'Did anyone find out about (unclear speech), I forgot to go through them.'

The students reply, 'Yeah, they were covered in lecture.'

The facilitator then asks, 'Have you seen, has Pete been in?'

The students respond, 'He has. Yeah, the camera is on.'

The facilitator replies, 'Is it on? Is it on?'

A student jokingly warns her, 'Be careful what you say, Alison!'

Another laughs and says, 'He's been filming me making tea.'

Two other students are huddled around the computer screen,

'Ready?'

'Yeah.'

Music blasts from the computer, not a song but an upbeat guitar-picking tune.

'I'll bet Pete will be glad he is recording all this.'

'He'll be loving it!' the other student replies.

The students find another website that plays musical scales and scales are played and repeated.

One of the male students leaning on a desk across the room asks, 'Is this week's case up yet?'

The students laugh.

And then, a brief conversation takes place between one of the students and the facilitator.

A student looking up from the computer: 'Oh, is Alison[2] back as well?'

The facilitator replies, 'Yeah, sorry.'

The student apologises, 'Sorry, Alison. I hadn't noticed.'

The facilitator facetiously remarks, 'Sorry to interrupt' to the student who responds, 'I just got over excited.'

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[2] I used pseudonyms to replace staff members' and students' names throughout my thesis. However, I used my own name when students referred to me in my role as a researcher.

During this exchange, the other students begin migrating toward the table. The room becomes quiet. Five students and the facilitator sit around the table. One of the students has pushed his seat away from the table and is leaning against the wall nearly outside the video's capture area.

Another student laughs and suggests, 'We should reposition Pete's camera. Aim it at the wall.'

At about the same time, the sixth student who has been sitting at the computer, looking at the screen and typing, turns on his chair toward the group. Clapping his hands together, he exclaims, 'Okay, we're in luck the case is working! Whooo!'

Another student asks, 'That's the first time this term, isn't it?'

The student responds, 'Yeah, should we play the trigger text through?'

The room becomes quiet and he clicks the mouse. A moment later a pre-recorded voice resonates from the computer's speakers:

> *'Mr Graham Brown is a 66-year-old widowed pensioner who has been brought to the local hospital after being found at home by his daughter lying on the bathroom floor.*
>
> *His daughter says that he was confused and unable to coherently explain what had happened, but she was able to find out that her father had tripped and fallen heavily against the bath, about 48 hours previously. He said he felt an immediate pain in his right hip and was unable to move. His daughter called a doctor straight away, who arrived within 30 minutes, commenced an infusion of intravenous saline and arranged for an ambulance to take Mr Brown to the hospital.*

On admission he was intermittently confused and complained of pain and swelling in his right leg. His blood pressure was found to be low, and on catheterisation of his bladder, very little urine was drained.'

The recording ends. A student then immediately attempts to guess which faculty member read the text by asking, 'Was that Tom?'

The students then make a few jokes and laugh before remembering that they are being filmed. The facilitator sits quietly at the table with her back to the camera.

After this brief discussion, another student suggests, 'Should we play it again?

One student describes the image that accompanies the trigger text by reading the following description displayed on the computer screen:

'A man in his sixties with two days' growth of beard, connected to an intravenous drip as he lies in a hospital bed, his daughter next to him.'

As the student finishes reading, three other students stand up and move towards the computer screen to take a closer look. The trigger text is replayed.

When the voice finishes a second time, the students begin asking questions and offering tentative explanations about Mr Brown's problems. One of the female students in the group begins writing factual details on a whiteboard.

The other students initially call out information, 'Mr Graham Brown', 'Sixty-six year old pensioner', 'Confused, on admission he's still intermittently confused', 'fell two days previously.'

The student seated at the computer reads sections of the trigger text aloud. Another student writes this information on the whiteboard in the form of a spider diagram.

After the students finish discussing details about the trigger text, a female student who has been writing on the whiteboard tosses her pen to a male student seated across the table. He looks at her and asks, 'What?'

She mentions something about recording symptoms. He gets up and walks around the table and begins recording information and questions as other students call out. Another male student boasts, 'We're a well-oiled machine.'

(PBL Group C, Session 1, 09:56:32)

1.2 Invitation

This extract provides a taste of PBL as practiced within an undergraduate medical programme in England. Even though PBL has been more widely adopted within Higher Education, these real-life accounts from PBL are relatively rare. Throughout the past decade, I have been immersed in PBL both as a researcher and as a facilitator. When I began my research, one of my aims was to record and to describe the PBL process based upon observations of PBL in practice within a newly established graduate-entry medical programme in England. I felt that this research would provide valuable insight to better inform understanding of the process of PBL and facilitation.

1.3 Drawn to Education and Facilitation

1.3.1 My Educational Experiences

Throughout my life I have been interested in educating others. My first formal educational role started in primary school working as a peer educator on public health themed programmes such as 'Say No to Sex' and 'Say No to Drugs'. I became very interested in 'alternative' forms of education when I attended a summer camp. This was run by the High Scope Institute and was aligned with an active learning approach. This continued in university where I volunteered as a public health peer educator.

After graduating from the University of Michigan with a Bachelor of Arts degree in Psychology and a Bachelor of Science in Nursing, I decided to work as a primary school teacher in Colombia. There I taught English to reception students whose English was limited. Communicating with the students was challenging as I spoke very little Spanish. Returning to live in the United States, I worked as a nurse in intensive care and also part-time as a diabetes educator. I was on track to train in anaesthesia when an opportunity arose to travel to Brisbane, Australia; where I spent a year working in hospitals.

When I moved to England in 1999, I spent some time considering my career. I worked through a book entitled 'What Colour is your Parachute?' (Bolles, 1998) This helped me to identify my interests. Through this exercise I decided to begin educating health care professionals in England about insulin pump therapy. I used a pump to manage my Type 1 diabetes and was surprised how little information was available on insulin pumps in England. I contacted a company and initially began working throughout England educating people about insulin pumps. This role expanded to include Europe, Russia and South Africa. I found this role very satisfying. I was able to share my knowledge and experience of insulin pumps and glucose sensing with others, helping them to become competent in using these tools. I worked in this area for four years. While I enjoyed training healthcare professionals and patients about insulin pump therapy and glucose sensing, I began to tire of the travelling the job required.

I then made a move to work in the NHS as a diabetes specialist nurse. This enabled me to continue working in insulin pumps and glucose sensing education, but this time I worked directly with patients. I began running intensive one-week programmes aimed at teaching small groups of adults with Type 1 diabetes how to self-manage their diabetes. The educational approach on the programme was aligned with principles of adult education (DAFNE Study Group, 2002) and aimed to educate not simply through lecturing the participants but through various activities and scenarios. I also worked as a research nurse supporting clinical trials in diabetes. The variety that working in research and clinical practice offered was very satisfying.

While working in this role, the University of Nottingham established a new Graduate Entry Medical programme (GEM) within the local hospital trust. This programme was recruiting health care professionals to be tutors for a Problem-Based Learning (PBL) programme. This opportunity interested me, as I was attracted to the idea of working in academia. This stemmed from my experiences as a university student rather than from direct experience gained by working in this area. The role appeared to complement my role as a diabetes educator and involved working with small groups of students, which I enjoyed. I saw the role of facilitating PBL as an extension of the teaching I had done.

1.3.2 Culture Shock of Facilitating PBL

I soon realised that facilitating was different from any educational role I had experienced. In all my previous roles, I was educating others. It didn't matter whether I spoke their language; I knew what I wanted to teach and could draw on my knowledge of the areas to educate my students. Using the knowledge I gained at High Scope, I tried to incorporate activities that would engage learners in an activity rather than rely solely instructing them. This approach resembled what I understood the PBL method to be.

The PBL process, however, was very different. Rather than being in charge and leading the group, the role of the facilitator was less defined. During my training, I heard phrases repeated such as 'Go with the group' and 'Trust the process.' These became mantras at GEM that I repeated but did not fully understand.

As I began working as a PBL facilitator, I found this educational role very different from those I had previously done in schools, healthcare, business or the NHS. For example, in my previous role as an insulin pump educator, I had specialist knowledge and clinical experience that I drew upon when educating other healthcare professionals be they nurses or professors about insulin pumps and glucose sensors.

Working as a facilitator at GEM, I found that I was not knowledgeable about many of the subject areas I facilitated. I still had expertise but not in many of the areas that cases would be covering. This put me in a very different position to those I had previously held. I also felt intimidated working with medical students. This was partly because I did not understand the material to the same degree as I had previously in my experiences as an educator. But this was also because I was not sure what would be happening during the sessions. I had worked within traditional and structured educational programmes that consisted of first identifying the aims and objectives of the session and then, based on these, adopting a mixture of teaching and activities that complemented them. Adapting to PBL and its distinctive educational approach within GEM proved to be challenging. I realized this once I began working as a facilitator.

1.3.3 Deciding to Read for a PhD

Shortly after starting my new post as a facilitator and while also working part-time in diabetes education, another part-time opportunity arose to read for a PhD in Education funded by the Centre for Social Research in Health and Healthcare. This studentship would enable me to undertake further study in education, which was something I had been contemplating for some time. I also felt the qualification would enable me to develop a career in academia and complement the research I was already doing in the NHS.

More importantly, though, I saw this as an opportunity to research PBL and facilitation. I felt that I was well positioned to undertake the study while working at GEM. In adjusting to my role as a facilitator, I looked to the literature on PBL facilitation and found that, on the whole, it didn't seem to fit with my experience. Also, little attention had been paid to studying the practices of PBL and facilitation. This changing approach to education was not unique to the context where I conducted my research. Rather it resulted from the changing nature of medical education.

1.4 The Contextual Backdrop to my Research

Within this section I will explore the national contexts within which I conducted my research. First, I will discuss how the 'prevailing political climate' (Brookfield, 1986, p.vii) has impacted upon medical education in England. An examination of how recent changes in medical education driven by government policy and General Medical Council policy have significantly altered medical education within England will follow.

Changes have occurred in medical education relating to where students are trained, which students are trained, how students are trained, and by whom. These changes have resulted in part from the recent expansion of undergraduate medical schools and programmes within England accompanied by newly adopted approaches to teaching and learning.

1.4.1 Expanding Medical Education within England

In 1997, the Medical Workforce Standing Advisory Committee's (MWSAC) issued a report calling for approximately 1000 student places to be created within undergraduate medical education in England to meet the future service demands of the NHS (MWSAC, 2001) A joint implementation group that included representatives from the Higher Education Funding Council for England (HEFCE), the Department of Health (DoH) and the General Medical Council (GMC) was formed to oversee the allocation of these places.

In 2000, the DoH published the NHS Plan. This policy called for an increase of an additional 1000 places for undergraduate medical students (DoH, 2000). Following four allocation exercises by the joint implementation group, the annual number of undergraduate medical students in England rose from 3614 in 1998 to 5894 in 2001. The additional 2280 students were absorbed by increasing the placements within existing medical schools, by acceptance into new programmes affiliated with existing medical schools or by admittance into one of the four newly established medical schools within England (DoH, 2000).

1.4.2 Graduate-Entry Medicine

Within their report, MWSAC also recommended establishing graduate-entry medical programmes in England (2001). While graduates previously had access to existing undergraduate medical programmes, fast-track programmes open only to graduates were new to medical education in England.

Adopting graduate entry follows the longstanding tradition set by medical schools in North America (Flexner, 1910) and more recently in Australia (Prideaux et al., 2000). During the past ten years, fourteen universities within the United Kingdom (UK) have established graduate entry medicine courses (Bligh, 2004). GEM is one of these courses and where I conducted my research study.

Other graduate entry medical programmes claim to offer shorter and less expensive training opportunities and to embrace more diverse student populations than traditional undergraduate courses (Prideaux et al., 2000). However, these claims have begun to be questioned (Powis et al., 2004; Searle, 2004). Nevertheless, increasing the number of medical student places and establishing graduate entry medicine within England have significantly impacted who would be selected for medical school and where they would be trained.

How these medical students would be taught also underwent radical changes. At the same time as the rapid and substantial increases in

student numbers was occurring, a survey identified a shortage of staff within academic medicine (Smith and Sime, 2001). The report estimated that 'between 10% and 15% of professorial and senior lecturer posts, and some 20% of lecturer posts are vacant. The percentage of posts that are vacant is a cause for concern, particularly in the context of the rapid expansion of medical education.' (Smith and Sime, 2001, p.9). Alongside the increasing student numbers and academic staff shortages, substantial changes to the teaching and learning methods used within undergraduate medical education were also occurring (Bligh, 2004).

1.4.3 Tomorrow's Doctors

The GMC is the regulatory body for physicians within the UK. Its policies aim to protect patient welfare and to guide doctors. The Education Committee of the GMC is responsible for 'promoting high standards of medical education and coordinating all stages of medical education' (GMC, 1993, p.4). The Education Committee has influenced medical training within the UK through its publication of *Tomorrow's Doctors: Recommendations on undergraduate medical education* (GMC, 1993; GMC, 2003; GMC, 2009). Of note, the Joint Implementation Group assessed applications for additional medical students, new medical programmes and schools according to criteria within Tomorrow's Doctors (MWSAC, 2001).

Initially, the need for Tomorrow's Doctors stemmed from 'external factors' like the rapidly changing technological developments within medical science, the shift of care from hospitals to community settings and the blurring of roles among doctors and other health care professionals (GMC, 1993, p.4). The rising number of medical students and staff shortages within academic medicine increased the need for new methods of training doctors (Bligh, 2004).

Tomorrow's Doctors calls for radical reforms of undergraduate medical education curricula. The emphasis of education extends beyond knowledge acquisition (GMC, 2003, p.2). The concept that learning is an end product of the curriculum has altered (Biggs, 2003; Ramsden, 2003); so that greater emphasis is placed upon 'a learning process that includes the ability to evaluate data as well as to develop skills to interact with patients and colleagues' (GMC, 2003, p.2). This shift from learning being defined as a product to learning defined as a process has had significant impact upon the provision of undergraduate medical education in England.

Tomorrow's Doctors outlines 14 general recommendations followed by nearly 100 detailed curricular outcomes (GMC, 2003). One of the general recommendations is aimed at addressing the long-standing problem of information overload within medical training:

> 'The scarcely tolerable burden of information that is imposed taxes the memory but not the intellect. The emphasis is on the passive acquisition of knowledge, much of it to become out-dated or forgotten rather than on its discovery through curiosity and experiment. The result is a regrettable tendency to under-provide those components of the course that are truly educational, that pertain to the proper function of a university and that are the hallmark of scholarship. Attitudes to learning that are based on enquiry and the explorations of knowledge are dulled by an excessive information load and by a system of examinations.'
> (GMC, 1993, p.5)

These issues are not new. The GMC recognised the 'overloading of the curriculum of education ... followed by results injurious to the student' in 1863 and in 1869 suggested that 'some limit must be assigned to the amount of knowledge that can be fitly exacted' (1993, p.5). More recent guidelines from Tomorrow's Doctors continue to call for similar action, 'factual information must be kept to the essential minimum that students need at this stage of medical education' (GMC, 2003, p.3). The latest guidance highlights the need for graduates to be skilled in 'applying their knowledge' (GMC, 2009, p.14).

Other recommendations include ensuring that,

> 'Teaching and learning systems ... take account of modern educational theory and research ... Learning opportunities must help students explore knowledge, and evaluate and integrate ... evidence critically. The curriculum must motivate students and help them develop the skills for self-directed learning.'
> (GMC, 2003, p.3)

1.4.4 Questioning the Evidence Underlying Tomorrow's Doctors

Tomorrow's Doctors lacks any references to supporting evidence for its policy recommendations; therefore, it is unclear how research has impacted the development of the policy recommendations. This leaves the policy open to criticism. One critique by Williams, the dean of the faculty of Medicine and Dentistry at the University of Bristol and Lau, a fourth year medical student has criticized the reform to the core curriculum of undergraduate medical training as harmful 'ideology' resulting in

> 'educational reform ... driven by enthusiasm for change rather than by rational responses to the shortcomings of traditional curriculums . . . Reformers always have a duty to prove that their proposals are necessary, sound, and practicable and that they will genuinely improve on whatever went before.' (2004, p.94)

Their criticisms seem appropriate, as one would expect the field of medicine, which relies so heavily upon evidence to influence its practice, would also seek strong evidence to support training and education approaches. Williams and Lau's criticisms of Tomorrow's Doctors Tomorrow's Doctors illustrates the demand by those responsible for implementing policy (e.g. Deans of Medical Schools) and those effected by policy (e.g. undergraduate medical students) for robust evidence that supports policy recommendations (2004).

While evidence was not explicitly referenced within Tomorrow's Doctors, other authors have since provided clear definitions of 'modern education theory' that are supported by educational theory and research. Maudsley and Strivens (2000) relate the concept of 'modern education theory' to specific educational theories: situated learning (GMC, 1993; Lave and Wenger, 1991), reflective practice (Schön, 1987), and experiential learning (Kolb, 1984), critical thinking (Brookfield, 1987) and problem solving skills (Barrows, 1988).

Many new medical schools and graduate entry programmes have followed the recommendations of the GMC to move away from factual recall and to develop curricula that incorporate *modern educational theory* and opportunities for self-directed learning (Howe et al., 2004). Collaborative teaching and learning methods within small student groups utilising case studies to guide the students' self-directed learning have been widely adopted (Howe et al., 2004). This approach is commonly referred to as Problem-Based Learning (Barrows, 2000).

This section has examined broader contextual factors that have contributed to the changing environment of undergraduate medical education within England and shaped the local context within my research was conducted.

1.5 Overview of my Research

This thesis is organized within seven chapters. Chapter one introduces the motivations for undertaking a study into PBL and facilitation. It also explores recent changes in undergraduate medical education in England that have impacted where students are trained, which students are trained, how students are trained and who trains students. In Chapter two, I review the literature on PBL, small group work and facilitation. Chapter three discusses the factors that influenced the design and methods of my research. My philosophical framework aligns with interpretivism, although I originally came from a positivist stance. My evolving research strategy has been based on qualitative methodology to allow an in-depth and open-minded exploration of the research setting and allow inductive development of my research questions and the subsequent emerging findings. I chose a combination of ethnography and case study because there is a lack of research exploring the culture and practices of PBL within the literature. I collected data using participant-observation, audio-visual recording, field notes, documents and personal reflections. These have been chosen for a range of theoretical and practical reasons that are outlined in detail within the chapter. In Chapters four, five, and six, I present the findings in two main ways. Firstly, I provide an overarching description of GEM and contextual factors of PBL. This mainly derives from my observations as a participant-observer and from official documents describing the formal view of PBL at GEM. Secondly, I focus on two broad themes arising from my audio-visual data and field

observations: student's engagement with self-directed learning and how facilitators make sense of PBL at GEM.

My findings reveal variability in what occurs during the times allocated to PBL. Certain features are consistent with previously defined PBL and PBL described for GEM in the course manual and provide illustrations of PBL working well. However, I also found examples of when the students were not engaging in the process and the facilitators were caught between the aims of PBL and influences of the broader faculty-generated curriculum. I reveal the tensions between the stated aims of PBL at GEM, the aims of the students and the aims of the facilitators. I also show examples of self-directed learning stimulated by the case that shows students demonstrating creativity, spontaneity and variety. I also highlight ways in which the students become distracted from PBL and are seemingly motivated, not by the process of learning for learning's sake, but by the pressures of assessment and the perceived need to acquire knowledge rather than to develop effective lifelong learning skills. This message is reinforced by teaching practices the students encounter within the hybrid curriculum. My study provides unique data about students' experiences of learning within a hybrid PBL curriculum and the distinctive role that facilitators serve.

CHAPTER 2: Reviewing the Literature

2.1 Introduction

This chapter explores the literature covering three broad areas of Problem-Based Learning (PBL): the origins, theory, and characteristics of PBL; various forms and practices of PBL across different educational contexts; and the debates surrounding research into PBL. Section 2.2 addresses the following questions: Where and how did the idea of PBL arise? What were the original defining characteristics of PBL? What educational theories inform/underpin this approach? Section 2.3 explores literature around small group work. It explores definitions and classifications of groups before then examining issues around the effectiveness pertaining to issues around membership and group process. Section 2.4 focuses on facilitating groups. Initially, this explores the general literature on small group work and then focuses on facilitating PBL within medical education. Section 2.5 builds upon this by examining the research on facilitation. This explores a framework of facilitator authority proposed by Heron (1999). Finally, Section 2.6 examines the challenges that researchers face in trying to understand the effectiveness and diverse PBL practices of these inherently variable approaches across different educational contexts. It includes an overview of different research approaches that have been applied to provide a context for my chosen methodology.

2.2 Origins, Theories and Characteristics of PBL

2.2.1 Origins of PBL

As described by Barrows, PBL is an educational method within which small groups of learners are first presented with problems that act as a stimulus for learning (1986). These reflect real-life issues that students will encounter in their professional practice and are intended to increase students' motivations for learning (Barrows, 1986). They establish, integrate and develop their understanding of the concepts underpinning the problem. Guided by a facilitator, they learn together through a process of engaging with problems.

The idea of PBL originated in part from Barrows' experiences at the University of Southern California where he trained third-year medical students on clinical placements in neurology (Barrows and Abrahamson, 1964; Barrows and Tamblyn, 1980). He noticed that his clinical students did not seem to be able to apply previous teaching from the pre-clinical phase to the clinical cases encountered on their placements. The approach was developed further while Barrows, who was on sabbatical, worked within a team to redesign the undergraduate medical curriculum at McMasters University (Barrows and Tamblyn, 1980). McMasters University in Canada pioneered the use of PBL as an educational approach in medical education (Barrows, 2000). As Taylor and Miflin (2008) highlight, it is important to recognize that Barrows' model of PBL was

conceived within a specific educational context. This distinction is important, as I shall later outline since PBL has since evolved in many forms.

2.2.2 Theories and Characteristics Underpinning PBL

In the following description PBL is described in line with Barrows' model of 'Authentic PBL' (2000, p.37). Barrows' original idea was that clinical based problems posed to pre-clinical students would stimulate students to activate prior knowledge. The benefits of using problems to stimulate learning are based in constructivist learning theory (Bruner, 1966; Hmelo-Silver, 2004; Norman and Schmidt, 1992a; Schmidt, 1993). Constructivist learning theory derives from constructivism in psychology and is the idea that humans construct knowledge and meaning from their experiences. Learning is viewed as a process where newly acquired knowledge is organized around a framework of existing knowledge. This association of new with existing knowledge aids recall and the application of the newly acquired knowledge. The broad aims of PBL are to i) fill knowledge gaps; ii) integrate knowledge and iii) develop students' problem-solving skills (Barrows and Tamblyn, 1980; Hmelo-Silver, 2004). Hung and Loyens argue that although PBL has had its detractors, the increasing interest amongst educators in constructivist learning theory during the 1990s has allowed educators to see the potential benefits of PBL (2012). Of more importance is the need for "cultivating students to become independent problem solvers and lifelong learners" (Hung and Loyens, 2012, p.4). Further

support for the utility of PBL comes from Schmidt, van der Molen et al. (2009). In looking at a single medical school, they found better interpersonal skills, practical medical skills, higher rating of the curriculum by students, fewer drop-outs, and small but positive differences with respect to clinical reasoning and medical knowledge (2009). There are limitations in drawing conclusions from a study of a single medical school. The authors limited their study due to the recognized differences between different PBL curricula across different institutions and thus the difficulty of analyzing cross-curricular data (Schmidt et al., 2009).

Savery and Duffy describe how PBL is consistent with the principles of constructivist learning theory. Again their argument rests on the description of a particular type of PBL where "all of the learning arises out of consideration of the problem" (1995, p.38). Learning objectives and additional resources are not provided alongside the case. The content domain is not emphasized as it might be in other case or problem-based approaches where the problem is presented in addition to other learning around the topic. They describe PBL as a "cognitive apprenticeship focusing on both the knowledge domain and the problem solving associated with that knowledge domain or profession" (1995, p.38) Their description of what might be called pure PBL is important to note since later I will discuss the tensions inherent in a hybrid curriculum like GEM where PBL is one component of several other learning settings such as lectures and lab sessions.

Barrows' model of PBL is detailed as follows:

> Students acquire an essential body of knowledge that is retrievable and useable in all domains that are required to effectively address clinical problems.
>
> Students develop the ability to use this knowledge effectively in the evaluation and care of patients' health problems; that is, they develop the cognitive skills appropriate to professional clinical reasoning.
>
> Students develop the ability to extend and improve knowledge to keep up to date and cope with new problems that may arise in their professional lives (self-directed learning skills).
>
> (In Taylor and Miflin, 2008, p.744)

Students do this by first engaging with problems. While exploring the problem, students work together in small groups and are encouraged to share their existing knowledge and theories. Vygotsky describes the Zone of Proximal Development as the level of understanding attainable by a learner when learning with a more expert peer or in collaboration with more capable peers (1978). In PBL this could be others with different prior knowledge and with a facilitator with more expertise (whether from prior content expertise or that gained from training and peer group discussions). Within GEM the expertise and capability of peers comes from the mixture of students having a variety of educational and social backgrounds. They bring mixed expertise from science and arts backgrounds and different ranges of experiences as graduates prior to commencing medicine. I shall discuss facilitator expertise in more depth later.

PBL group sizes vary across curricula. Barrows recommends groups of between 5 to 7 students (Barrows, 2000, p.38). Small group work incorporates a social component within the learning process that differs from didactic approaches commonly used within a lecture theatre. Lave and Wenger (1991) argue that learning arises from the social context. They propose the model of situated learning. With PBL the pre-clinical training process can be more similar to clinical situations and the social participation that students will encounter as clinicians. PBL sessions can be a training ground for future "communities of practice" (Lave and Wenger 1991). However, it should be noted that although PBL is trying to simulate a clinical social context, this is achieved through a group of peers working together on a paper case in a non-clinical environment. Hence, I would suggest that the PBL community of practice is a precursor to the later clinical community of practice the students will encounter as professionals. This pre-clinical PBL phase contrasts with the types of apprenticeships described by Lave and Wenger (Yucatec midwives, native tailors and meat cutters) where students learn in real-life situations. However, later clinical training is more closely aligned with Lave and Wenger's descriptions of situated learning and communities of practice. Pre-clinical learners start on the periphery of the community and through 'legitimate peripheral participation' can develop expertise through engaging with social interaction that is aligned with the context (Lave and Wenger, 1991, p.29). The PBL group can act as a precursor community and resembles aspects of the clinical situation and social interactions they will

encounter as clinicians.

Perhaps one of the difficulties of whole-heartedly (or generally) aligning PBL learning environments with reflections of situated learning theory is the variability of whether a clinical expert is facilitating the group. Theoretically the acquisition of expertise for PBL students comes from their relational interactions with peers and facilitator rather than the apprenticeships with experts discussed by Lave and Wenger (1991). This raises an interesting question about the role of the facilitator within the PBL community of practice that links with the debates around content and non-content expertise of facilitators covered later. In relation to facilitators, Spronken-Smith and Harland explored how a newly established community of practice could support teachers making the transition to becoming facilitators within a PBL curriculum (2009). Within GEM weekly case briefing meetings (CBM) can be likened to a community of practice. PBL facilitators meet to discuss the following week's case and reflect on progress of their PBL groups to date. A more experienced peer with either content expertise or process expertise or both facilitate CBM. Newer facilitators are integrated into these meetings, which provide ongoing support.

Returning to Barrows' description of the PBL process, as the problem is discussed gaps or limits in the group's collective knowledge are identified. Students assume responsibility for identifying these gaps. After this, they

identify resources and use them to answer their questions. Within the original model of PBL, students are expected to develop skills in self-directed learning and metacognition (Barrows, 2000; Barrows and Tamblyn, 1980).

Metacognition is knowing about knowing (Gijselaers, 1996; Hmelo-Silver, 2004). Flavell states 'Metacognition refers to one's knowledge concerning one's own cognitive processes and products' (1976, p.232). It encompasses both one's knowledge about one's own cognition and also the regulation of one's cognition. Poor metacognition leads to an inability to assess one's level of skill or understanding in a particular area; students can have poor insight into the inadequacy of their understanding of a topic. The metacognitive process involves students identifying what they need to know, determining how they will fill their learning needs and evaluating reasons for either achieving or not achieving their learning goals. This approach is intended to mirror approaches to problem solving used by professionals (Barrows, 2000). Increasing research into how to reduce errors in clinical decision making and diagnostic reasoning (Croskerry, 2000; Graber, 2003) has highlighted the importance of developing good metacognition.

2.2.2.1 Understanding the Principles of Basic Medical Science

Barrows relates his model of PBL to core principles of medical education (2000). Barrows' first principle addresses the need for physicians to be 'effective', 'efficient' and 'humane practitioners' (Barrows, 2000, p.5). This principle contains the need for doctors to have a sound understanding of principles of basic medical science in order that this knowledge can be applied to addressing the patients' complaint. Related to this is the need for students to adopt a clinical reasoning process when addressing complex problems. This process involves generating a range of possible hypotheses, gathering data through history and examination, analysing and synthesising the data in order to decide upon a diagnosis and treatment plan (Barrows, 2000). Throughout this process, students develop metacognitive skills as they question and reflect upon their decisions. Barrows argues that this clinical reasoning process needs to be adopted as students learn the basic medical sciences in order to establish links between this knowledge and medical practice (2000). Knowledge, clinical reasoning and metacognition are central tenets of PBL (Barrows, 1986; Barrows, 2000). Thus PBL in practice needs to be found to promote these skills.

2.2.2.2 Self-Directed Learning

Barrows identifies a second core principle of medical education that relates to the need for the practice of learning to continue after students leave the formal teaching environment; lifelong learning is necessary due

to the changing nature of medical science, patient care, and health care systems (2000). The need to be self-directed learners underlies this principle. An aim of PBL is allowing students to develop self-directed learning skills to identify what they need to learn from the problems they encounter (2000). Rather than being taught information by the faculty, students engage with a problem or case. This is intended to allow them to guide their own learning. Zimmerman and Lebeau summarise aspects of students' self-directed learning via PBL: through discussions within a group, the students discern what they already know from what they need to learn (2000). Students have time allocated for self-directed learning during which they can research these learning issues and seek to answer their questions. The students return to the group to share what they have found and evaluate their learning (Zimmerman and Lebeau, 2000). Students are guided through the process by facilitators (Barrows, 1986; Schmidt, 1983; Walton and Matthews, 1989; Wood, 2003).

Barrows describes self-directed learning in terms of the following skills: self-monitoring, self-assessment, defining learning needs, determining the appropriate learning resources, using resources effectively, evaluating the accuracy and value of the information in the resource, recording or filing the information of future reference and applying what has been learned to the present patient problem and future problems (2000, pp.30-32). His argument aligns with the General Medical Council's recommendations on undergraduate medical education:

> 'Learning opportunities must help students explore knowledge, and evaluate and integrate (bring together) evidence critically. The curriculum must motivate students and help them develop the skills for self-directed learning.' (2002, p.3)

Of note, motivation is mentioned here. Motivation in learners has been categorized in educational psychology as intrinsic and extrinsic (Ryan and Deci, 2000). Intrinsic motivation refers to the drive to learn due to the inherent interest in a subject in an effort to improve knowledge and skill, for enjoyment and for self-fulfilment (Ryan and Deci, 2000). Extrinsic motivation is driven by the need to accomplish a certain outcome, for example pass an exam or assessment to proceed on a course of study (such as summative assessments at GEM to enable students to continue onto the next year of the course) (Simmons et al., 2004). When students take a genuine interest in their work they are intrinsically motivated. If students learn purely to pass exams this is extrinsic. I would argue that in the hybrid curriculum at GEM, although there are opportunities to cultivate intrinsic motivation, the emphasis placed on passing summative assessments can detract from opportunities to engage in learning for self-fulfilment and enjoyment.

Norman and Schmidt argue that 'there is no evidence that PBL curricula result in improvement in general content-free problem-solving skills' however 'it enhances intrinsic interest in the subject matter' and 'appears to enhance self-directed learning skills and this enhancement may be

maintained (1992b, p.557). Pedersen found evidence of more intrinsically motivated behaviour during PBL compared with regular class learning activities (2003).

Thus the reported benefits of PBL are that students construct knowledge that can be applied to future problems, develop metacognition, reasoning and self-directed learning skills, become skilled in group work and motivated to learn independently (Barrows, 2000; Biggs, 2003; Gijselaers, 1996; Wood, 2003). These benefits are aligned with the GMC Educational Committee's recommendations outlined in Tomorrow's Doctors (1993; 2003).

2.2.3 Contrasting PBL and Didactic Teaching

The PBL approach contrasts with traditional lecture-based courses where the emphasis is primarily on an individual expert (i.e. teacher) passing on knowledge to a large group of students in a didactic manner with the students as passive recipients (Biggs, 2003). PBL as an educational method is argued to provide greater opportunities to develop these core skills than does a lecture-based approach (Barrows, 2000; Biggs, 2003). PBL can encourage a deep learning style where students can critically analyse new ideas, linking them to prior knowledge and developing understanding to be applied in new contexts over the long term (Biggs, 2003). This is desirable learning for medical students who will apply their learning in novel contexts over their careers.

Deep learning exists where students try to understand the meaning of what is being studied (Ramsden, 2003; Wood, 2003). It contrasts with surface learning approaches where students learn by rote to be able to recall information without necessarily understanding it (Newble and Entwistle, 1986; Ramsden, 2003). Interestingly in a study by McParland et al. where PBL was used with psychiatry students, PBL did not seem to promote more effective learning styles although students did perform better in examinations (2004).

While PBL sounds impressive in theory, according to Barrows, implementing it fully is both 'difficult and expensive' (1986, p.485). At GEM the building has been designed around PBL with multiple small base rooms to accommodate the PBL groups. This is integrated with space for lecture theatres and labs for practical sessions. The design of the building reflects the hybrid nature of the PBL curriculum at GEM. GEM also provides facilitators for each PBL group, thus requiring more staff than a lecture based course.

2.3 The Literature in Relation to Small Group Work

A key feature of PBL is that the learners are organized into groups in order to engage in the learning process. They learn with peers and a facilitator potentially enhancing the level of understanding obtained by each individual due to the Zone of Proximal Development described by Vygotsky (1978).

2.3.1 Defining Groups

Groups have been defined in a number of ways. Elwyn et al. provide a simple definition of a group as '... small number of people who have a shared identity, a shared frame of reference, and shared objectives' (2001, p.4). This definition stresses the need for each component to be shared among the group members. It raises the following question: could a collection of individuals with different objectives accurately be described as a group? While this point may sound pedantic, it uses a straightforward benchmark of sharing to distinguish between a collection of individuals and a group. When setting out to study learning in small groups as I have done, it is necessary to make this basic distinction as drawing conclusions about group work based on observations of a collection of individuals would be misguided.

Jaques developed a unique and more complex definition of groups by drawing together a combination of essential characteristics (2000). These characteristics define groups according to their 'needs', 'collective perception', 'shared aims', 'interdependence', 'social organisation', 'interaction', 'cohesiveness' and 'membership' (Jaques, 2000, pp.1-2). These resonate with the characteristics described in communities of practice by Lave and Wenger (1991). While these characteristics describe the group as a whole unit, it is important to recognise that a group is still a collection of individuals. The individuals who take part in the groups or who compose these groups can bring a range of influences to the group process. At GEM the students come from diverse educational backgrounds from a range of science and arts subjects. There is a wide range of ages from early 20's to over 40 years old. Some have had careers prior to commencing the course and some have come straight from undergraduate courses.

2.3.2 Classifying Groups

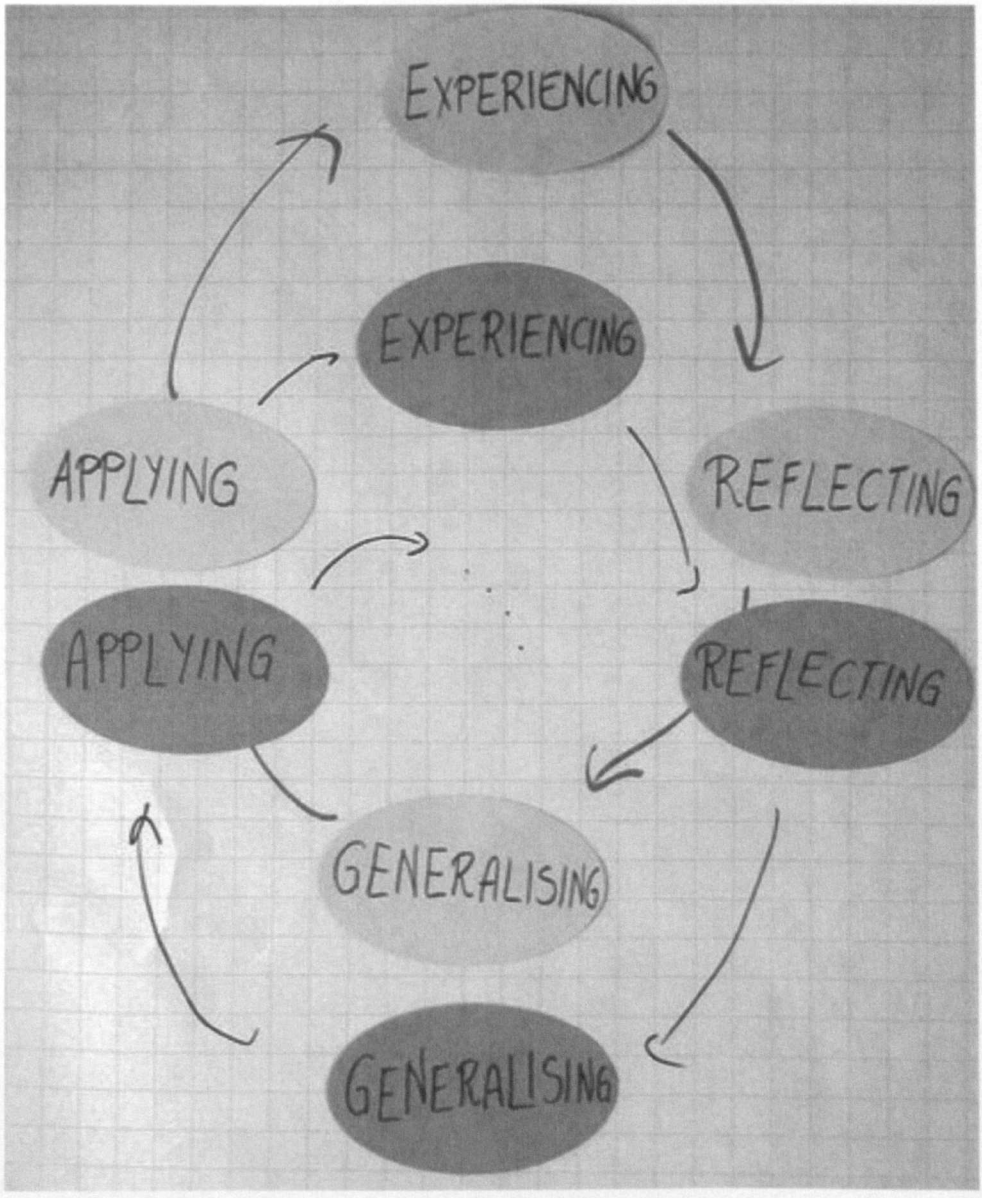
Groups can be classified as formal or informal (Elwyn et al, 2001). Formal groups are 'created as mechanisms within a wider organisation ... Their functions tend to be clearly specified, their membership restricted and their control over resources limited' (Elwyn et al., 2001, p.4). Informal groups can be described as 'grass roots' (ibid.). These groups grow from the needs of its members. Understanding how groups are defined and classified is necessary when examining the evidence that supports group

work in Higher Education.

2.3.3 Small Group Work as an Effective Means of Study

The evidence to support group work as an effective means of study is closely linked to various adult learning theories, for example Kolb's experiential learning cycle (1993). Kolb's cycle involves the following steps illustrated in Figure 2.1.

Figure 2.1 An Interpretation of Kolb's Experiential Learning Cycle



The picture representing experiential learning was taken by devilarts and is copyrighted. It is reproduced here under a Creative Commons licence (Attribution-Non-Commercial-Share Alike 2.0 Generic) http://www.flickr.com/photos/devilarts/2458317215/.

Elwyn et al. recommend adding a step to Lewin and Kolb's experiential learning cycle that involves 'critical discourse with others' (2001, p.177). This highlights the 'importance [of] social discourse as a means of consolidating or changing understanding' (Elwyn et al., 2001, p.177). This

illustrates the epistemology associated with adult learning theory that knowledge evolves and continually changes based upon experiences. Within a group learners share their individual experiences and grow a shared experience as they learn together. At GEM students draw upon previous educational and life experiences during group discussions to help address the problem. They share new learning with each other and evolve a shared experience of learning as they tackle each problem. Elwyn et al. (2001) identify a number of benefits gained from small group work (Table 2.1).

Table 2.1 Benefits Gained from Small Group Work

- Encourages learners to control and direct their learning
- Enable learners to identify gaps in their understanding and make connections between concepts
- Activates previously acquired understanding
- Promotes questioning and discussion
- Promotes higher-level activities conducive to deep learning
- Allows application and development of ideas
- Promotes change in individual attitudes and motivation
- Improves confidence and self-esteem

(Adapted from Elwyn et al. 2001, p.178)

How might the classification of groups as formal or informal relate to effectiveness of the group (i.e. the readiness of groups to engage in the experiential learning cycle)? It seems like a mismatch could occur by formalising group work within curricula in the hope of achieving outcomes linked with adult learning theory or deep learning. Would outcomes linked with adult learning theory or deep learning be more likely to be achieved via informal groups? In informal groups the agenda and work is intended to arise from the members' motivations. From observations and experience of facilitating PBL groups (i.e. formal groups), I note that students may feel pressured to take part not due to their motivation (or other reasons linked to adult learning theory) but rather to satisfy the requirements of the curriculum. This raises important questions about whether effective adult learning is more likely to occur within formal groups. I will share observations relating to this in my findings.

2.3.4 Group Content and Process

Through reading the literature about small group work, I began to understand group work in terms of *content* (e.g. the task), *process* (e.g. the group dynamics) and *structure* (organisation of activities) (Jaques, 2000, p.v). The content relates to what the group does. Elwyn et al. identify the variety of tasks groups encounter (2001). Content relates to the rationale behind forming the group, the job that will be addressed and the formal or informal nature of the group (Elwyn et al., 2001). Group process broadly relates to the group dynamics and how the work is done.

The importance of it is highlighted by Jaques, 'Process ... though rarely attended to, is usually what determines whether a group works effectively or not' (2000, p.v). Within GEM facilitators are encouraged to nurture the group process and dedicate time to practices like 'starting a group' (See Chapter 4).

Elwyn et al. define process according to three components: Active Participation, Specific Task, and Reflection (2001, pp.5-7). These highlight the importance of involving each member, focusing the group's attention and learning from the group's experiences (2001). The authors outlined the components of the small group process (2001). These are included in Table 2.2.

Table 2.2 Components of the Small Group Process

- Environment
- Facilitation
- Methods used in group work
- Forming
- Storming and Norming
- Performing
- Evaluating the group process
- When groups go wrong

(Adapted from Elwyn et al. 2001, p.iii)

This table illustrates important factors that influence how a small group functions. Facilitation is one of the components of the small group process.

2.4 Facilitating Groups

2.4.1 Established Ideas about Facilitation

> The facilitation of learning ... is a highly complex psychosocial drama in which the personalities of the individuals involved, the contextual setting for the educational transaction, and the prevailing political climate crucially affect the nature and form of learning. Yet among theorists and practitioners of adult learning this complexity is frequently ignored. (Brookfield, 1986, p.vii)

Facilitation is a key component of PBL. Facilitation has been widely explored outside PBL by Heron (1999) and Brookfield (1986) and within PBL literatures by Barrows (2000), Dolmans et al. (2010) and Maudsley (1999a, 1999b). Established ideas about facilitation are mainly situated within the literature relating to small group work. Jacques discusses points to consider during three stages of facilitation: planning, preparation and doing (2000). Elwyn et al. offer another three-stage model that includes: 'preparatory work', 'group work' and 'follow-up' (2001, p.51). Heron presents a model of facilitation based upon different dimensions and modes (1999).

In this section, I will briefly outline the three stages described by Jacques

and discuss how similar models could be applied to exploring the facilitation of PBL. This would help to broaden the view of facilitation beyond what currently exists within the medical education literature (i.e. a view of facilitation primarily focused on what happens during PBL sessions).

2.4.1.1 Planning

Planning can occur before, during or after PBL group learning sessions. The planning stage is important because it broadly relates to issues about content and process expertise of facilitators. There have been many debates within the literature about the required level of content expertise and process expertise (Rothman and Page, 2001; Schmidt, 1993). However, there has been little mention about how this expertise is developed or descriptions relating to the application or sharing of this expertise among facilitators. I explore issues relating to these issues within my findings.

2.4.1.2 Preparation

The preparation stage generally relates to contextual issues such as the group size, membership and environmental factors. It is also necessary to recognise that context can refer to external factors that influence the group process (Elwyn et al., 2001). Elwyn et al. raised the following questions when exploring the 'wider context' of a group:

- 'Why and how have individuals come together?'
- 'What personal or professional 'baggage' have these individuals brought to the group?'
- 'What is the culture of the organisation in which the group is required to operate?'
- 'What is the nature of the task or tasks that the group is required to address?'
- 'What external pressures does the group face?'

(2001, pp.21-31)

Looking at one of these questions in greater detail uncovers many factors that can impact the process of facilitation within groups. It is interesting to consider the individual characteristics that each learner can bring to the group. Elwyn suggests numerous factors (2001) (See Table 2.3).

Table 2.3 Learner's Characteristics

- Prior knowledge and skills (science background vs. non-science)
- Attitudes, beliefs and values
- Personality
- Previous experience of group work (both positive and negative)
- Cultural or religious factors (think broadly to include armed forces)
- Relationships between group members outside the group
- Economic factors
- Life events (recent or forthcoming)

(Elwyn et al., 2001, p.23)

How do these items get exposed, recognised and addressed within groups? This question may be difficult to answer simply by observing a group in action as the group members may not explicitly refer to these factors (Elwyn et al., 2001). Having an awareness of the potential impact of such characteristics may lead to a clearer understanding of a group's behaviours. Therefore, it is important to consider them. In my findings chapter, I will explore other contextual factors relating to PBL such as facilitators' levels of expertise and their expectations along with the groups varying levels of engagement with the PBL process and PBL cases.

2.4.1.2.1 Contextual Issues within Groups

Recommendations for groups to include no more than eight to ten members are frequently found within group work literature (Abercrombie, 1960; Elwyn et al., 2001; Jaques, 2000). The size of a group appears to be inversely related to the number of interactions and levels of co-operation amongst the members (Desportes and Lemaine 1988; Øvretveit, 1993 both located within Elwyn et al, 2001). When reading the literature about the practice of PBL, it is important to recognise that the size of the groups will impact the process. It is, therefore, necessary for this information to be included in the literature.

Another factor to consider is how the membership of the groups impacts the process of facilitation. There is also a need to consider factors like the processes used to allocate students to groups, the students' educational

backgrounds and maturity levels and the balance of male and female members (Jaques, 2000).

The physical environment within which the group is meeting also impacts facilitation (Abercrombie, 1960; Elwyn et al., 2001; Jaques, 2000). Factors mentioned include seating arrangements, shape of the table, room temperature and ventilation, size of the venue along with available resources like whiteboards, computers and textbooks. Other questions can be raised such as 'Do students share their PBL rooms with other students?' or 'Are rooms used for other purposes besides PBL?' While to date, these factors have not been widely discussed within the PBL literature, it is necessary to consider how they might impact the process of facilitating PBL groups. These factors are explored within the findings chapters.

2.4.1.3 Doing

Finally, Elwyn et al and Jaques discuss the process of facilitation. This is the area that overlaps with much of the research into facilitation within PBL and medical education. I will therefore explore these aspects within the next section.

2.4.2 Facilitating PBL within Medical Education

While Barrows (1988) discusses a 'tutorial process' it relates to only one of Jaques stages: the time during the session (Jaques, 2000). By examining

established ideas about facilitation like Jacques' stages, educators can adopt a broader view of facilitation that also considers the planning and preparation stages. Some models of PBL are quite structured and prescriptive such as the Maastricht 7 Jump Model (Schmidt, 1983). Other models are less structured and the three stages described by Jacques and Elwyn et al. might be more loosely applied.

As PBL becomes more widely adopted and Higher Education embraces more facilitative teaching methods (Biggs, 2003; Savin-Baden, 2003), it is important to understand facilitation. Facilitation is argued to be a core component of PBL:

> 'The ability of the tutor to use facilitatory teaching skills during small group learning process is the major determinant of the quality and success of any educational method aimed at 1) developing students' thinking or reasoning skills (problem solving, metacognition, critical thinking) as they learn, and 2) helping them to become independent, self-directed learners (learning to learn, learning management). Tutoring is a teaching skill central to problem-based, self-directed learning.' (Barrows, 1988, p.ii)

Facilitators take on key roles in supporting students during the PBL process and to assist them as they develop skills in critical thinking and self-directed learning. Facilitation is a complex educational role (Little, 1997). It involves more than imparting knowledge to students; the facilitator is nurturing the development of deep learning and metacognition. Wilkerson and Hundert describe the need for facilitators to adopt new relationships with their knowledge of the subject matter

and how this is shared with students along with their relationship with students (Wilkerson and Hundert, 1997). I explore these themes in detail within Chapter 6.

Little research has been done that explores the practice of facilitation and what facilitators do during PBL (Hak and Maguire, 2000; Leung, 2002). I address this in my findings where I share observations of facilitators in practice. I explore issues highlighted by Barrows that demonstrate how facilitation can prove to be a challenging role for educators:

> 'Attending to the group's educational progress at the metacognitive level and the group's interpersonal dynamics are the two basic challenges of the tutor in small group learning.' (1988, p.13)

While Barrows identifies challenges of facilitating, the transition from teaching to facilitating can also prove to be challenging. He recognises that, '[facilitation] is a difficult skill to understand and apply for many teachers who are used to didactic teaching approaches' (1988, p.ii). Knowles also highlights challenges associated with becoming a facilitator:

> 'fundamental and terribly difficult change in self-concept in moving from "teacher" to "facilitator of learning" ... It required that I focus on what was happening to the student rather than on what I was doing. It required that I divest myself of the protective shield of an authority figure and expose myself as me'
> (Knowles, 1975 quoted in Neville, 1999)

In the findings we see the outworking of some of these challenges as facilitators interact with the group and share their experiences during

CBM. Savin-Baden has identified numerous challenges facing PBL facilitators during the transition from teacher to facilitator (2003). These include uneasiness with the new role, uncertainty about how to aid students' independent learning, doubt about the PBL philosophies and feeling unprepared to facilitate (2003, p.46). Findings from research of facilitation of PBL support these claims. Maudsley reports that inexperienced tutors struggle to determine when and how to intervene in the PBL process (2002). This supports claims by Savin-Baden who argues that:

> 'Tutors who are unclear or uncomfortable with facilitation may revert to more familiar or traditional methods of instruction. At one end of the spectrum, tutors may use their expert knowledge and experience to direct the groups' learning by continually quizzing students or by providing answers to students' questions. At the other, tutors may remain silent and allow students to take the lead. The first approach can result in students becoming dependent on the tutor while the second can lead to role confusion and alienation of the facilitator' (2003, p.50)

Thus it is important for facilitators to be clear about their role, the process of facilitation and how to facilitate rather than teach (Wilkerson and Hundert, 1997). In my findings and also in my experiences of facilitating, I see examples of both occurring at GEM and the tension between the teacher and facilitator roles alluded to above is evident.

Effective facilitation is necessary in order to promote learning within PBL (Barrows, 1988; Dolmans et al., 2002; Taylor and Miflin, 2008). However, facilitation challenges the core role traditionally held for teachers: the

expert, the organiser, the speaker (Biggs, 2003; Ramsden, 2003). Facilitators who refrain from directing students' learning are essential to the PBL process (Neville, 1999). In order for PBL to achieve its claims, facilitators must behave in a manner than is aligned with the philosophy of PBL. A tutor who understands the 'why' behind PBL and facilitation may be more likely to model and encourage these behaviours with the students (Taylor and Miflin, 2008). Training and on-going development play an important part in supporting staff members as they adopt and practise within this role (Dolmans et al., 2002; Moust, 2010; Wilkerson and Hundert, 1997).

2.4.3 Defining Facilitation

If facilitation of PBL is new to higher education and uncertainty exists relating to the role of the facilitator, one needs to explore how facilitation is defined within the literature.

Barrows' description of the role of the PBL 'tutor' has influenced much of the research within medical education on facilitation (Barrows, 1988; Barrows, 2000). I will, therefore, begin this section by examining Barrows' model of facilitation. Within his monograph on 'tutoring[3],' Barrows clearly outlines the roles and responsibilities of PBL facilitators during PBL (1988).

[3]While Barrows uses the term 'tutor' to refer to 'facilitatory teaching skills' (1988), I have chosen to use the term 'facilitator.' This term provides a less ambiguous meaning.

2.4.3.1 Metacognition: The primary responsibility of facilitators

Metacognition is central to Barrow's model of facilitation, 'This concept of metacognitive thinking skills provides the key to the positive, active role of the tutor.' (Barrows, 1988, p.3). He identifies the 'basic function' of facilitation as to guide the students' development of these metacognitive skills throughout the PBL process and to the point at which the group members independently demonstrate these skills (1988).

2.4.3.2 Additional Responsibilities of Facilitators

In addition to metacognition, Barrows identifies additional 'tasks' for which the facilitator is responsible. These tasks along with their aims and examples are outlined in Table 2.4 below.

Table 2.4 Responsibilities of Facilitators

Barrow's Tasks		Aim
Keep the learning process moving, to make sure that no phase of the learning process is passed over or neglected and that each phase is taken in the right sequence.		Ensure each stage in the problem-based, self-directed learning process is deliberated and reflected upon
Probe the students' knowledge deeply (Use focused questioning)		Never let ideas, terms, explanations, comments go unchallenged or undefined Ensure students understand concepts not just use the correct label
Ensure that all students are involved in the group process		Avoid being the centre of all discussions
Monitor the educational progress of each student in the group – 'educational diagnosis'		Early identification of students with learning difficulties could enable support
Modulate the challenge of the problem or task at hand to create and maintain a 'creative tension'		Maintain students motivations for learning

(Adapted from Barrows, 1988)

On reflection I recognise how this framework of responsibilities has informed my understanding and expectation of PBL facilitation, both as a practitioner and a researcher. Barrows' task model informed the analysis of my data.

2.4.4 The Dynamic Nature of Facilitation: Modelling, Coaching, & Fading

According to Barrows, the facilitator's roles within groups change as the students develop metacognitive skills (1988). Initially, the facilitator begins by '*modelling*' the thinking processes associated with PBL to the students. This involves posing questions to the group by thinking aloud, 'What do we understand by the phrase, "Chest Pain"?' and by directing the group. Over time, the facilitator is expected to adopt a '*coaching*' role and support the group to become skilled in using these skills. Eventually, if the group becomes proficient, the tutor 'fades' and allows the group to function autonomously (Barrows, 1988). Barrows' approach is based upon Cognitive Apprenticeship Theory (Collins et al., 1989).

Some important questions to pose include whether all facilitators are skilled to model key aims of PBL to students? Even if facilitators possess these skills, are they able to coach students effectively? Staff development programmes can support facilitators in gaining these skills (Moust, 2010; Wilkerson and Hundert, 1997). This will also be influenced by how much

time facilitators spend within groups[4]. Therefore, do facilitators spend sufficient amounts of time with students to support them to develop these skills?[5]

Barrows' model of facilitation (e.g. tutor's roles and responsibilities) has been developed according to his model of PBL (i.e. Authentic PBL) (2000). As will be discussed later in this chapter, there are many variations of PBL. How applicable is Barrows model of facilitation to other species of PBL? While the variability of PBL is recognised within medical education research (Barrows, 1986; Davis and Harden, 1999; Kelson and Distlehorst, 2000; Taylor and Miflin, 2008), no one considers how this variability may impact upon the models of facilitation provided within the literature. I will examine this point further in the next section.

2.5. Research Exploring Facilitation

There is a relatively small body of research specifically looking at the roles and experiences of PBL facilitators. Existing research into PBL facilitation has focused on tutors' levels of content expertise (Rothman and Page, 2001); its impact on student achievement (De Grave et al., 2002) or on the PBL process (Moust, 2010; Taylor and Miflin, 2008). The majority of designs have been largely measured retrospectively using questionnaires

[4] This point is relevant to my study as the frequency with which individuals facilitate PBL at GEM varies from one block of cases per year to every block. This is explored further in Chapter 4.

[5] See Section 4.5.2.1 Asynchronous Rotation of Facilitators and Students in PBL Group.

(Dolmans et al., 2002) and interviews (Maudsley, 2002). Reviews of PBL facilitation have identified a need for more qualitative research into tutors' understanding of PBL and their behaviours within PBL sessions (Dolmans et al., 2002; Rothman and Page, 2001).

Maudsley undertook research aiming 'to explore how a cohort of first-ever 'foundation' tutors in a new problem-based curriculum characterised and made sense of problem-based learning' (2002, p. 162). The study took place from 1996-97 at the University of Liverpool medical school immediately following the first semester that PBL was implemented into the undergraduate curriculum. The study's sample consisted of 34 foundation tutors. The retrospective, cross-sectional study design involved semi-structured telephone interviews about PBL and problem solving with the tutors. After taping and transcribing the interviews, the author conducted on-going inductive analysis of the qualitative data. The author interviewed all 34 tutors with each interview lasting approximately 20 minutes. The majority were men, who were medically qualified and had facilitated in nearly all of the 21 PBL sessions. Many of the tutors conceptualized PBL as being student-centred and involving small-group work. However, they ignored the reflective component within the PBL process. The subjects identified "good" tutors as those who were knowledgeable about when and how to intervene and those who could empathise with students. In general, the tutors were unclear about the relationship between PBL and problem solving. Maudsley concluded that

the majority of tutors felt positive about the philosophy of PBL but failed to recognize the reflective components. Many felt uncertain about "when and how to intervene without teaching" (2002, p.171). Being internally motivated and having direct experience of PBL helped some of the tutors balance their confusion with the educational rationale. This highlighted possibilities for future staff development. It is also necessary to recognise contextual and methodological issues relating to Maudsley's study.

Maudsley conducted semi-structured telephone interviews with her participants. Even though issues relating to reflection were not mentioned, this does not necessarily mean that reflections did not take place during the PBL sessions. The respondents may have failed to recall episodes during which reflection took place. However, one might argue that reflection is not prioritised as it was not mentioned during the interviews (1999).

Also, these facilitators were interviewed at the end of the first semester. One explanation could be that as the facilitators were in the first semester of PBL, they may have been preoccupied with the initial or earlier steps in the PBL process such as encouraging the students to critically engage with the trigger text, to identify researchable and answerable learning issues, to build rapport with and within the group to establish an environment of trust. This could assist the process of feeding back learning issues in a safe environment. It might also contribute to the reflective process. It could be

argued that expecting tutors to facilitate all aspects of the PBL process during their initial attempts during the first semester of a PBL programme might be unrealistic.

One weakness of interview data like Maudsley's work is that her conclusions rely upon the reports provided by facilitators. Observing facilitators during PBL sessions could build upon Maudsley's interview findings (2002). In my methods chapter, I will argue that ethnography could be used more widely to inform research into PBL practice and facilitation (Dolmans et al., 2002; Hak and Maguire, 2000; Leung, 2002).

2.5.1 Researching What Happens during PBL

> A considerable number of medical schools worldwide have implemented, at least in part, a problem-based learning (PBL) approach in their curricula. Research to date has largely neglected the issue of the actual activities and learning processes that mediate and moderate the relationship between these programs and their cognitive outcomes. (Hak and Maguire, 2000, p.769)

Hak and Maguire propose that researchers need to shift their attention onto what happens during PBL (2000). A component of this would be to study how facilitation occurs within PBL. Looking at research, the majority of studies collect their data outside the classroom (Dolmans et al., 2002; Rothman and Page, 2001). Few studies have observed what facilitators and students actually do during PBL sessions.

Tipping, Freeman and Rachlis conducted a study at the University of Toronto Faculty of Medicine that aimed 'to determine faculty and student perceptions and knowledge of effective group dynamics and to develop recommendations for student and faculty training' (1995, p.1050). They studied 3 PBL groups. Each group consisted of 9 undergraduate medical students and 1 facilitator. They collected data from these 27 students and 3 faculty members through projective questions before and after the tutorials, post-tutorial questionnaires and live and videotaped observations during a four-week period. Each tutorial group was observed and videotaped on two occasions by the same observer. They observed aspects of group dynamics relating to climate (e.g. physical setup and emotional climate), involvement, interaction, cohesion, productivity and leadership (p.1051).

The researchers found that 'data collected from the observations and videotapes were markedly different from the self-reported data obtained from the students and faculty' (p.1052). The researchers observed patterns of interaction and involvement during which some students did not participate in the PBL session. For example, a student was seen sleeping throughout a PBL session. They also reportedly observed communication directed towards the facilitator rather than among the group. They did not observe any examples of cohesion: cohesion related to group solidarity and norms (p.1051). In relation to aspects of productivity, 'goals were not articulated, methods for achieving goals

were unclear, measurement of achievement was nonexistent and no time was spent in planning for future sessions' (1052). The researchers saw no evidence of reflection from the students or facilitators on any aspect of group behaviour (p.1052). This work highlights how students' and facilitators' reports of group dynamics during PBL may differ from the researchers observations of group dynamics during these sessions.

The researchers clearly state their belief that a 'commitment to PBL equals a commitment to group dynamics' (p.1052). They call for the training programmes that 'consistently ask group members to observe, reflect, analyse and adjust' (p.1052). The intended outcome of training is clearly stated, 'that evaluation of group performance and open discussion of effective and ineffective behaviours need to become as natural as exploring the medical literature for answers to clinical problems' (p.1052).

The findings of this study contradict the popular descriptions of PBL (Barrows, 2000; Schmidt, 1983). Questions arise regarding how often mismatches like those reported above occur during PBL. This resonates with my experiences of facilitating PBL where students sometimes resisted engaging with the process[6].

[6] See findings in Chapters 5 and 6.

A discussion paper by Bowman & Hughes (2005) provides possible explanations for the behaviours observed by Tipping, Freeman and Rachlis (Tipping et al., 1995). Bowman and Hughes explore 'the emotional responses of the tutor and the potential effect of a tutor's emotional needs and responses on the group function' (2005, p. 146). The authors draw upon Bion's work on group dynamics (1961). Bion suggests that all groups have a primary task. When anxiety relating to performing this task arises, group members may consciously or unconsciously adopt regressive and task-avoiding strategies aimed at reducing anxiety. These, in turn, may distract the group from its primary task.

Bowman and Hughes applied this framework to PBL (2005). The 'primary task' of PBL is to belong to 'working groups whose common aim is to identify areas of learning and share new knowledge' (Bowman & Hughes, 2005, p. 146). The facilitator's primary role is to promote learning by 'modelling reasoning skills and encouraging the discipline of focused questioning, justifying choices, logical thinking, integrating and summarising information' (Bowman & Hughes, 2005, p. 146). Bowman and Hughes identify 'the non-directive role of the tutor, unpredictable nature of the group process and the potential intimacy of PBL' as possible trigger for anxiety along with the demands of learning medicine (2005, p.148). They focus on a variety of 'anti-task' behaviours that tutors might adopt. These include providing therapy to students, seeking approval from students or didactically teaching students during PBL. All of these

behaviours could distract the group from its primary task. This paper draws attention to Bion's theory of group dynamics and highlights the importance of clarifying the primary tasks of PBL for students and facilitators.

Unfortunately, one major weakness is that Bowman and Hughes argument is supported by theoretical vignettes (2005, pp. 148-150) as opposed to actual observations like those made by Tipping, Freeman and Rachlis (1995). However, their research highlights the need for observational research of PBL groups (Hak and Maguire, 2000) and facilitators (Dolmans et al., 2002). The framework developed by Bowman and Hughes could be used to inform observations of actual PBL groups (2005).

2.5.2 Facilitators' Levels of Content Expertise

A major topic within the medical education literature relates to the content expertise of PBL facilitators. Interestingly, this contrasts with the literature about group work, which focuses on the importance of small group process (Biggs, 2003; Elwyn et al., 2001; Jaques, 2000). The group work and facilitation literature assume that facilitators possess content knowledge (Heron, 1999). Heron developed a model within which he explores modes of facilitation and authority (1999). This is more complex than whether facilitators possess content expertise.

2.5.2.1 Unpredictability of PBL

In PBL there is an aspect of unpredictability relating to how the each session will unfold. The facilitator must adapt to this. Heron describes this as 'Dionysian planning' which 'is impromptu, often improvisatory, responding flexibly and imaginatively to the presence of the group, to its feel and mood and thrust, as well as to the purpose of the course.' (Heron, 1999, p 80). He continues 'The Dionysian planner will certainly have the overall objectives in mind; will have a thorough mental grasp of the range of relevant topics, methods and resources; and will probably have a variety of alternative programme outlines in mind. But the actual plan emerges, unfolds, one activity at a time, as the realities of the developing situation make one option feel more fitting than another for the next step.' (Heron, 1999, p. 80). Prior to coming across Heron's model, I conceptualised this as the improvisational nature of PBL facilitation.

2.5.2.2 Authority

It follows that PBL facilitation is complex because PBL is extremely variable, it is unpredictable; the role of the facilitator involves entering an unknown environment where the aim of the session is that the locus of control for the session lies with the students. By that I mean that students are meant to become self-directed learners (Taylor and Miflin, 2008). That requires a radical shift in the mindset of educators who are used to setting the agenda (i.e. learning outcomes) for education and delivering what is normally a pre-determined teaching session according to those issues

(Wilkerson and Hundert, 1997).

In reviewing the roles and responsibilities of facilitators in PBL, Maudsley stresses that while educators may feel 'threatened' as they adjust to guiding students learning, it is important to avoid being 'authoritarian' (1999b, p.658). She is keen to point out that 'Those who confuse authority with authoritarianism may feel uncomfortable, unaware that authority is exercised differently, not abandoned.' (1999b, p.658). In order to follow this advice, it is necessary to understand where the differences lie. Heron describes an authoritarian approach where:

> The traditional teacher decides what students shall learn, when and how they shall learn it and whether they have learnt it; and presides over this regime with a forbidding authoritarian charisma. Student autonomy is relegated to in-the-head following of many long lectures, to answering questions or asking them, to discussion in tutor-led seminars, and to doing homework on prescribed reading, writing or practical tasks.' (1999, p.21).

Margetson argues that authoritarian approaches like these are 'out of place' within PBL programmes and contrast with PBL's aims to foster a 'participative, co-operative, reflective, critical, and informed educative practice.' (1994, p.658).

Like Maudsley (1999b) and Margetson (1994), Heron argues that authority is at the heart of facilitation (1999). He identifies three types of authority: tutelary, political and charismatic (Heron, 1999, pp.19-20). Tutelary authority deals with the knowledge facilitators possess about the subject

matter (content expertise) and competence 'in the appropriate teaching and ... learning methods for students to acquire that knowledge and skill' (1999, p.19) (process expertise). Heron's concept of tutelary authority is unique in so far as it combines content and process expertise. This contrasts with much of the literature on PBL facilitation within which these concepts are separated rather than interwoven. Another interesting point is that Heron argues that facilitators require expert knowledge of the topics. This provides a contrasting view with the approach of utilising non-content experts to facilitate PBL at GEM. According to Heron's model, this would compromise the facilitator's tutelary authority. This could also be impaired in those individuals who facilitate only occasionally at GEM; and, therefore, may not be as familiar or competent with facilitating PBL[7], that is they have less process expertise.

Heron's concept of authority also includes a political component. 'Political Authority' involves how decisions about structuring learning are made regarding 'objectives, programmes, methods, resources and assessment of learning' (1999, p.20). Heron also relates Political Authority to his model of facilitation within which he identifies three 'modes' of facilitation: hierarchical, co-operative and autonomous. These modes represent who makes decisions within the group. Acting in the hierarchical mode (Heron, 1999, p.8), the facilitator leads the group and takes decisions relating to a range of areas or 'dimensions' (p.6). Within

[7] This is explored further in Chapter 4.

the co-operative mode, the facilitator and students share power and negotiate aspects of the group process. Finally, adopting an autonomous mode, the facilitator is giving the group 'freedom to find their way, exercising their own judgement without any intervention' from the facilitator (p.8). To some extent these dimensions resemble aspects of the Theory of Cognitive Apprenticeship (Collins et al., 1989) that influences Barrows concept of facilitation (Barrows, 1988; Barrows, 2000).

While these modes apply to the practice of facilitation at GEM, Heron's broader concept of Political Authority is somewhat limited. By this I mean that within higher education, an academic may exercise political authority when planning a lecture or a module (Ramsden, 2003). However within GEM, many of the facilitators could be seen to have limited political authority. Many decisions on how to structure PBL and to set objectives are taken by the Educational Committee as detailed in the Educational Policy and Curriculum Specification (GEM, 2003a). Facilitators at GEM follow a plan of cases that are intended to focus on learning objectives set by senior faculty within GEM in collaboration with colleagues on the five year course on the Nottingham campus. Their scope to exert political authority is more limited than would be the case for teaching staff involved in delivering lectures or workshops within the taught component of the hybrid curriculum at GEM. Facilitator's political authority resides

primarily within the various modes they may adopt in practice[8].

The final component of Heron's model is Charismatic Authority. This relates to the facilitator's presence within the group. Heron describes charismatic authority as how 'Facilitators influence learners and the learning process by virtue of their presence, style and manner ... way of being and behaving' (1999, p.20). Whereas I have highlighted limitations relating to facilitators tutelary and political authority, this concept of charismatic authority would apply to all facilitators at GEM. I use Heron's model of authority as a framework to explore the complexity of facilitating PBL at GEM as I present my findings[9].

2.5.2.3 Who are Facilitators?

What criteria are needed to be a facilitator? Barrows discusses this point specifically, 'ideally, content expertise and process expertise but if needing to choose better to be a process expert.' (2000). This point was revised from an earlier statement he made: tutors need to be content experts. This sparked debates and much research within the literature into the impact of being a content expert or non-content expert (Rothman and Page, 2001). One of the difficulties that researchers face is the ability to define 'content expertise' (Maudsley, 1999a). I discuss the expertise of facilitators in GEM within my findings.

[8] This will be explore further within Chapters 5 and 6.
[9] This is presented within Chapter 6.

The evidence about the benefits of being a content expert is varied. Gilkison explored how tutors' different levels of content expertise impacted upon the approaches used to facilitate groups (2003). Gilkison conducted a study at the University of Liverpool Faculty of Medicine between 1999-2000 that aimed 'to describe approaches used by tutors in PBL tutorials and to identify differences between tutors from medical and non-medical backgrounds' (2003, p. 6). The subjects included one medically trained facilitator and one facilitator from a humanities background. One facilitator worked with a first year PBL group while the other facilitated a second year group. It is unclear from the report how facilitators were paired with groups. The researcher gathered data by observing and audio taping sessions two and three during separate PBL cases. Students and tutors were also interviewed following the tutorials. The observation focused on the discourse between the tutor and students. This study found that the tutors used various techniques to raise awareness, to facilitate group process and to direct learning. However, the medical tutor raised awareness by asking questions more often while the non-medical tutor was more likely to facilitate the group process.

Gilkison mentions that students "positively appreciated" the contributions from each tutor even though these differences were recognized (2003, p.12). This may partly call into question the relevance of the debate surrounding tutor expertise within PBL. Valuing the different contributions

of tutors from various backgrounds may be more logical than pitting "experts" against "non-experts" especially as students will be practicing medicine within multidisciplinary teams.

This methodology used within the study causes concern. Rothman and Page identified that "expert" or "non-expert" facilitators carry out the majority of research on content-expertise. This leads them to question the objectivity of this research (2001). In this case, the researcher, a registered nurse, was closely involved in the program as a "non-expert" tutor. She was observing and interpreting the behaviours of colleagues. This could have biased her objectivity. The author did identify potential conflicts and made attempts to control observer bias by using several methods for data collection. However, the possibility of reporting negative findings about tutors with whom she worked would have likely challenged her relationships. This could have been addressed by involving a researcher outside the programme to closely review the collection, analysis and interpretation of the data.

However, as many new tutors feel unsure about how to intervene during the PBL sessions (Maudsley, 2002), these findings are likely to transfer to other settings. This research identifies the positive effects of numerous techniques for facilitators. Tutors from either background could use these to strengthen their ability to raise awareness or facilitate group process within PBL sessions. The author concludes:

> 'The use of qualitative technique to observe PBL groups and identify emerging themes begins to illuminate the techniques employed by PBL tutors to raise students' awareness and facilitate the group process; this represents an important key to understanding the facilitation of PBL tutorials.'
> (Gilkison, 2003, p. 13)

This view draws attention and support to the utility of qualitative methods like ethnography to explore the role of facilitators during PBL. It echoes calls by other researchers (Dolmans et al., 2002; Leung, 2002).

Barrows mentions that the ideal situation would be to have content experts who are also process experts facilitating groups, this does not appear to happen in practice (2000). This may be due to the cost associated with using physicians to facilitate PBL.

What are the limitations of research on content expertise? The definition of 'content expertise' is unclear (Rothman and Page, 2001). Another limitation relates to the methods used to study the impact of content expertise. Content expertise has been assessed in a variety of ways mainly using different types of questionnaires. There is limited research directly observing what content and non-content experts do during PBL.

2.6. Debating the Evidence for PBL

PBL has stirred up much debate within medical education. A review by Albanese and Mitchell reported benefits from PBL that related to higher scores on students' clinical examinations and faculty evaluations along with reports from students and faculty that PBL was more enjoyable (1993). These benefits were overshadowed by their findings that students scored lower on examinations of basic sciences (i.e. lacked knowledge) and felt less prepared in the basic medical sciences. PBL was also seen to be more costly to implement. The authors concluded 'care needs to be exercised in implementing PBL' (1993, p.78).

Another review published in the same year found that students from PBL programmes scored higher in clinical examinations and evaluated their programmes more positively than students from traditional programmes. No differences were identified among programmes in miscellaneous tests on clinical and factual knowledge. While students from PBL curricula scored lower on Part 1 of the US licensure examination compared to students from traditional programmes, the authors concluded that 'the results of our meta-analyses support the superiority of the PBL approach over more traditional methods' (Vernon and Blake, 1993, p.557).

Colliver has frequently questioned the quality of evidence supporting the effectiveness of PBL (1999; 2000; 2001; 2002; 2007). His concerns relate

to poor methodologies employed by researchers and outcomes based upon 'perceptions, attitudes, self-ratings and opinions, not measures of educational effectiveness such as measures of knowledge and skill' (2007, p.534). He also strongly criticises the educational theory supporting PBL claiming it 'is mostly metaphor, not rigorous, tested, confirmed scientific theory' (2002, p.1220). It is important to recognise the value of Colliver's critiques. Even advocates of PBL concede that scientific evidence to support PBL is limited:

> 'It is ironic that a professional community that prides itself on adherence to the scientific method has swung so strongly toward [PBL], despite considerable evidence that the differences in favour of PBL, at least at the level of curricular comparisons, are small indeed' (Norman and Schmidt, 1992a, p.557)

After 30 years why is the debate about whether PBL is effective continuing? One issue relates to policy. Tomorrow's Doctors lacks any references to the supporting evidence base for its policy recommendations (2003; 2009); therefore, it is unclear how research has impacted the development of the policy recommendations (Maudsley, 1999a). This leaves the policy open to criticism. One critique by Williams, the dean of the faculty of Medicine and Dentistry at the University of Bristol and Lau, a fourth year medical student has criticised the reform to the core curriculum of undergraduate medical training as harmful 'ideology' resulting in

> 'educational reform ... driven by enthusiasm for change rather than by rational responses to the shortcomings of traditional curriculums ... Reformers always have a duty to prove that their proposals are necessary, sound, and practicable and that they will genuinely improve on whatever went before.' (2004, p.94)

Their criticisms seem appropriate, as one would expect the field of medicine, which relies so heavily upon evidence to influence its practice, would also seek strong evidence to support training and education approaches. While the reason for omission is unclear, Williams and Lau's criticisms of Tomorrow's Doctors underscore the demand by those responsible for implementing policy (e.g. Deans of Medical Schools) and those effected by policy (e.g. undergraduate medical students) for robust evidence that supports policy recommendations (2004).

Another explanation is that researchers are trying to prove whether 'PBL' as a single entity is effective using mainly quantitative research methods that measure significant changes of key variables (Albanese, 2000; Colliver and Markwell, 2007; Vernon and Blake, 1993). Problems associated with this approach become apparent in the next section.

2.6.1 Exploring the Meaning of PBL

This appears to be related to the popularity of PBL. PBL is used around the world in Higher Education and within a range of academic disciplines such as law, architecture, business, science, engineering and health care (Macdonald and Savin-Baden, 2004; Wilkerson and Gijselaers, 1996).

Within health care, PBL is widely used for training doctors, nurses, dentists, pharmacist and other health care professionals (Taylor and Miflin, 2008). Within medical education, PBL has become part of the pre-clinical components that focus on teaching the basic medical sciences (Howe et al., 2004) and also within clinical and postgraduate training (Macallan et al., 2009; Smits et al., 2002).

As a result of this popularity, the practice of PBL across different institutions and disciplines differs from the original model developed at McMasters. PBL does not represent one particular educational method. According to Barrows, 'The term problem-based learning must be considered a genus for which there are many species and subspecies' (1986, p.485). This has lead to various meanings and interpretations that impact upon how PBL is practised and the educational objectives achieved (Barrows, 1986; Taylor and Miflin, 2008).

In preparing to become a PBL facilitator prior to enrolling for my doctoral studies, I read about the Maastricht 'Seven Jump' model. This is a prescriptive PBL approach where the facilitator guides the students through a series of specific steps (Schmidt, 1983).

During a 3-day facilitator-training course, I participated in a PBL group. During our discussion of how to approach the problem, I proposed we follow the 7 jump model. A colleague laughed and told me that we

practiced a less restrictive form of PBL. This left me feeling confused. I remember stressing the point that the 7 jump model was PBL, but this was discounted. As a new facilitator, I had not yet realized that the term 'PBL' applied to a variety of educational practices. However when I began my research, I frequently encountered this issue highlighted within the literature like that reported by Lloyd-Jones et al.:

> 'PBL in action is currently characterized by many different strategies. What is happening at the coalface in Liverpool may be quite distinct from that at Southern Illinois, Maastricht or Flinders.' (1998, p.492)

Barrows recognized that PBL had evolved into a diverse range of practices. His taxonomy of problem-based learning methods attempts to map out the various approaches and their educational outcomes (1986).

He notes that:

> 'All descriptions and evaluations of any PBL method must be analyzed in terms of the type of problem used, the teaching-learning sequences, the responsibility given to students for learning and the student assessment methods used.' (1986, p.485)

According to Barrows' taxonomy, GEM would fit into 'modified case based' learning. This describes learning that relates to clinical scenarios and incorporates some aspects of the clinical reasoning process and self-directed learning (1986, pp.483-4). This is discussed further in Section 4.4

In a study looking to understand the extent of this variability, Kelson and Distlehorst conducted a postal survey of 68 North American medical

schools that explored the structure of their PBL programmes. They aimed 'to sort out the range of educational practices that are labelled PBL' (2000, p.168.) Their survey provides a detailed picture regarding the extent to which PBL practices vary.

The authors used Barrows model of PBL as the standard against which other PBL models were compared. Their study found that when compared to the McMasters PBL model (Barrows, 2000), there were several areas where PBL varied. For example, group size, use of hybrid curricula (a mixture of PBL with didactic teaching), the degree of student self-directed learning, and use of reflection within the PBL process. They conclude:

> 'PBL in medical schools has become a generic category encompassing almost any teaching approach that incorporates a patient problem in any format. Yet virtually every program that has adopted the PBL label, no matter what its structure, length, or place in the curriculum, expects the full range of student outcomes: knowledge, problem solving, self-directed learning, and collaboration. It is almost as if the PBL label itself is meant to magically confer the results.'
> (Kelson and Distlehorst, 2000, p.180-1)

The term 'hybrid curriculum' is widely used within the literature on PBL (Blumberg, 2000; Dolmans and Schmidt, 2010; Kelson and Distlehorst, 2000; Taylor and Miflin, 2008). Armstrong describes the 'hybridization' of the Harvard Medical School PBL curriculum as seeking to 'innovate without sacrificing the best of the old, to stimulate individual initiative without inefficiency, and to balance the latest developments in medical

sciences with the age-old values of healing' (1997, p.137-38). These lofty aims take shape within a curriculum that introduces PBL while also retaining 'lectures, labs and conferences' (p.139). This hybrid approach is seen to 'accommodate a variety of learning styles' and avoids simply 'replacing all lectures with [PBL] discussion groups ... merely substituting one lopsided system for another' (Armstrong, 1997, p.139). Many programmes have adopted a hybrid PBL curriculum. Kelson and Distlehorst report that 70% of the respondents to their survey described their courses as hybrid PBL curricula (2000). While the hybrid approach appears to be widely adopted, Lim raises concerns about mixing PBL with 'exam-centered, lecture-based conventional curricula' and thereby diminishing the benefits expected from PBL (2012, p.1). This resonates with descriptions provided by Barrows in his taxonomy of various PBL approaches (1986). Within my finding chapters, I provide a description of the hybrid PBL approach practiced at GEM. I go onto to explore ways in which the self-directed component of PBL and the taught components of the curriculum co-exist and how this impacts upon the facilitators.

The many definitions of PBL act as a confounding factor within the debate relating to a lack of evidence to support the effectiveness of PBL. Rather than a specific entity, PBL is viewed as an abstract educational concept with numerous contextual meanings. Various curricula use the term 'PBL' to describe very different approaches to teaching and learning. This leads to claims even by proponents that 'PBL is a recycled idea with an identity

crisis' (Maudsley, 1999a, p.179).

This confusion about what is meant by the term 'problem-based learning' presents challenges to educational researchers exploring the practice and effectiveness of PBL. Kelson and Distlehorst call for further research that explores how modifications to the original model of PBL may impact on the practice of PBL. Taylor and Miflin attempt to resolve the dilemma of the diversity of PBL by advocating flexibility in the adoption of either "whole-of-curriculum" PBL or selected educational principles as the context allows (2008, p.742).

In addition to researchers, staff and students involved in PBL programmes have also voiced objections to PBL. One primary concern relates to the substitution of self-directed learning or PBL in place of didactic lectures covering basic medical components of the curriculum. Critics argue that factual knowledge is necessary to allow students to engage in worthwhile discussions. While they identify the drawbacks of passively spoon-feeding students, they also recognize that students learning within PBL can be impacted by 'dysfunctional groups' or by 'ineffective facilitators' (Williams and Lau, 2004, p.93). Here people using PBL identify contextual variables that may impact the practice of PBL and ultimately question whether PBL achieves its theoretical aims. However, it is important to recognise that similar criticisms made of didactic teaching (Biggs, 2003; Ramsden, 2003).

Miflin argues that 'better ways of looking at how PBL works are dependent on better ways of understanding PBL' (2004, p444). She questions the shared understanding relating to small group work within PBL. She discusses the importance of group dynamic within the PBL curricula and highlights the integral role group work plays in PBL (2004). Miflin explores and critiques the literature on small group learning to gain clearer understanding of PBL (2004). By 'singing from the same hymn sheet' (Miflin, 2004, p.444), opposing sides may be more likely to understand the other side's perspective.

These arguments motivated me to expand the scope of my review beyond the medical education literature and to explore and critique literature relating to small group work. These points about criticisms of PBL and the apparent diversity of practices also stimulated my desire to examine PBL using a different research approach to gain understanding of PBL within a particular setting. Although the literature highlights diversity of PBL practices, there is little research that examines in detail what occurs within a PBL labelled programme such as GEM. I will argue later that ethnography provides an appropriate tool to provide such insights.

2.7 Conclusion

Within this section, I have reviewed a selection of important research on PBL small group learning and facilitation. I have aimed to examine issues relating to facilitation both within the context of PBL and more generally within the context of small group work. I have identified how the role of the facilitator is central to the process of PBL. I have examined the idea of effective facilitation and explored the underlying educational theories. Facilitation has sparked much discussion and debate (e.g. experts vs. non-experts). Many of the research findings on PBL facilitation are based upon second-hand accounts of what facilitators do or claim to do. Few studies are based upon direct observation. As a result, questions about what happens during PBL sessions remain unanswered.

Chapter 3: Methodology

3.1 Introduction

Within this chapter, I will discuss the methodology I have used in this research. This will involve exploring issues relating to my philosophical stance, research strategy and specific research methods. Together these represent the qualitative approach I adopted in designing and conducting the research presented in this dissertation.

I argue that the complexities of PBL in practice are best studied using qualitative research methods. I have adopted ethnography, which offers the best methodological fit with my research questions to explore what facilitators and students do during PBL sessions (Hammersley, 1992; Silverman, 2000).

3.2 Research Aims and Objectives

While many studies have explored PBL and facilitation, the methods tend to rely upon collecting data outside of the classroom. Researchers frequently depend on 'generated data' (Ritchie, 2003, p.36) collected via interviews or questionnaires. For example, Maudsley explored how tutors make sense of 'trying not to teach' using interviews (2002). While research using generated data is informative to obtain 'insight into people's own perspectives on and interpretation of their beliefs and

behaviours' (Ritchie, 2003, p.36), it provides insights into the practices of PBL and facilitation that arise outside the classroom. This data is once removed from actual practice because the researcher is relying upon accounts provided by informants rather than directly gathering the data. Stubbs and Delamont argue that:

> 'One of the major faults in educational research is the almost total neglect of classroom studies – that is, the neglect of direct *observation* of teachers and pupils *inside the classroom*. It is a paradox that research concerned with teaching and learning has often so assiduously avoided looking directly at what happens between teacher and pupil . . . Educational research has tried to find the key to understanding educational processes by staying outside the classroom, and administering tests and questionnaires to samples of 'subjects'. Such research is easy to handle. But it is unclear whether there is any relation between such data and what goes on inside classrooms.' (1976, preface)

My aim is to lift the lid on the practice of PBL as it occurs in a particular medical school setting, a need highlighted by Hak and Maguire (2000). I started out with an interest in exploring and observing what facilitators do during PBL sessions. I broadened the focus of my ethnography to include what the students also do during PBL along with a more general exploration of the practices of PBL within a GEM's medical curriculum. My interest in studying what happened during PBL stems from my own experiences of facilitating PBL and also from recognizing a gap in the research literature (Leung, 2002). While PBL is a topic of much research interest, few researchers have entered the classroom to study it (De Grave et al., 2002; Hak and Maguire, 2000). Researchers have discovered differences between what they observed to occur in the classroom and

the descriptions facilitators and students reported on these occurrences (Tipping et al., 1995; Miflin et al., 1999). Through observing PBL sessions and collecting data from Case Briefing Meetings (CBM) and field notes I generated as a participant-observer within the case setting, I seek to explore the complexity of what happens during PBL and the richness of facilitating PBL. I also seek to discover other themes arising from the data (Stubbs and Delamont, 1976).

3.3 Choosing a Qualitative Research Strategy

3.3.1. Philosophical Underpinnings

> "Questions of method are secondary to questions of paradigm, which we define as the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways."
> (Guba and Lincoln, 1994)

My philosophical stance shifted during the course of this research. The initial motivation driving my research was to try and discover directly what occurs during PBL. I needed a research strategy that would allow me to explore the detail and complexity of a social setting and be open to new discoveries about PBL in practice. I did not want to trust someone else's interpretation of what occurs (i.e. through interview or survey data) but rather to see it for myself. As a facilitator already working in the setting, I observed PBL practices that differed from descriptions in the literature. I felt concerned that others' descriptions of what occurs would be filtered representations of reality and that different constructions

might introduce bias and inaccuracy like those reported by Tipping et al. (1995) (See Section 2.5.1). This belief that observation would allow me to see the reality of PBL relies on naturalism, the assumption that people would do what they normally do during PBL and that I would be able to accurately represent this in my findings (Ritchie, 2003). In this piece of research, video-taping PBL sessions was as close as I could get to observing the primary data source (Pink, 2001). The pragmatic and theoretical reasons for this choice will be discussed in Section 3.6.1 'Video-recording PBL sessions.'

My previous research experience had been in clinical trials and was underpinned by a positivist stance that I accepted without question (Bryman, 2004). I realized that quantitative approaches would not fit the issues that I wished to explore. I did not have a hypothesis to test nor did I have a set of isolated variables to measure and quantify. Instead, I was interested in exploring with an open-mind what might be occurring in PBL sessions, particularly in regard to facilitation. I increasingly realized that studying the social world was messier and that viewing 'reality' would involve interpretation in order to make sense of my observations (Pink, 2001). An interpretation of my data would be offered for others to see and compare. This, in turn, would lead to further interpretation (Ritchie, 2003). My initial assumption that I could see and report reality was shifting. I was beginning to align my thinking more with an interpretivist stance (Crotty, 1998).

As a researcher my background affects my view of the world and my relationship to the knowledge I am expressing through this research. I have a background in facilitation and this gives me insider knowledge into the topic I am researching. I position myself as disclosing experiences of PBL, but also recognize that these observations are filtered through the lens of being a practitioner (facilitator); previously coming from a positivist tradition of research; being a novice researcher; being a nurse (non-medically trained) educator working within a medical school; and many other factors. I will be unaware of many of the influences affecting my epistemology as they are so integral to me as an individual. I acknowledge that unlike quantitative research, where objectivity is paramount, I am venturing into a philosophical approach and methodology that embraces subjectivity and multiple meanings.

3.2.2 Selecting a Qualitative Research Strategy to Study PBL

> 'Medical education is a complex, diverse field and effective practice is often defined by contextual factors; similarly, it relies on powerful networks of personal relationships.' (Bunniss and Kelly, 2010, p.359)

Central characteristics of qualitative research strategies provide suitable tools to consider how people make sense of their environment; describe the context of the study and recognize its impact; emphasise process; adopt flexible approaches and identify emerging concepts from the data collected (Bryman, 2004, pp.279-284). Qualitative research methods have been adopted to study medical education for decades (Becker et al., 1961;

Atkinson, 1981; Sinclair, 1997).

Qualitative research strategy provides a suitable method for exploring questions like 'What is PBL?' and 'What do students and facilitators do during PBL sessions?' Qualitative studies can provide 'detailed and in-depth knowledge' regarding how facilitators and students behave during PBL sessions (De Grave et al., 2002, p.178). As discussed within the literature review (Section 2.6.1) PBL is a varied educational approach. The idea of identifying and isolating key variables risks stripping PBL from the context within which it is practiced.

Those who are keen to research the effectiveness of PBL question the utility of using qualitative research methods. Colliver argues that it is of foremost importance to prove whether PBL works, before researching issues related to what happens during PBL (2001). I would argue that this reasoning is flawed. PBL represents a variety of educational approaches (Barrows, 1986; Kelson and Distlehorst, 2000). As it is such a varied approach, 'contextual' and 'explanatory' research (Ritchie, 2003, p.27) can serve to understand the diversity and complexity surrounding PBL. These can also be used to explore what happens within PBL. This is a fundamental step that should precede research that seeks to appraise the effectiveness of PBL.

Qualitative research is well suited to exploratory research, because it relies upon induction. The strategy recognizes that issues arise from the data rather than the idea that the data is used simply to prove or refute the researcher's hypothesis. Qualitative research also recognizes the value of conducting research within a natural environment. My research aims to provide a different perspective on PBL practice by studying it within its natural environment – the classroom. By exploring how facilitation occurs within practice, my research discovers some of the unique aspects of PBL practice and facilitation that haven't been identified within previous studies using survey or interview methods. This is a response to Hak and Maguire's call to 'open the black box' of PBL and observe what is occurring in the classroom (2000).

3.2.3 Evolution of my Research Strategy

Prideaux encourages researchers to provide clarity regarding the theoretical framework underlying research within medical education (2002). This clarification is essential for researchers undertaking qualitative research. Like PBL, the label 'qualitative research' embodies a number of diverse approaches and philosophies (Murphy et al., 1998).

When I began considering what research questions I would use, I was motivated to improve facilitation in part by clarifying some of the confusion I perceived about its role in PBL. This research could have been designed as an action research strategy. However, as I began exploring the literature, my motivation shifted from changing practice to an exploring

what facilitators do during PBL sessions. While my research is linked to action research (Carr and Kemmis, 1986) in that it is exploring PBL in practice, I am not setting out to change or improve the practice. Although, questions arising from my research could inform future action research projects and I will explore the implications of my findings on practice. Hence, my research design developed from my experiences in the field and alongside my evolving philosophical stance.

I adopted an Iterative-Inductive approach when conducting this research project. O'Reilly describes this as a 'sophisticated inductivism and flexible research design' (2005, p.26). This form of inductivism asserts that theory does not simply arise from the researcher's data. Rather, it encourages the researcher

> 'to be open about one's preconceptions, to read the literature and consider what theories have already been formed on a given topic, then to proceed in a manner which is informed but open to surprises.' (O'Reilly, 2005, p.27)

My research is informed by literature on facilitation and PBL, and aims to examine whether what occurs in the field relates to descriptions offered in the research literature and to meet any 'surprises' that may arise from the gathered data.

What helped me to adjust my beliefs were my research questions. What I wanted to know and the questions I was asking did not fit with 'scientific' research. The idea of isolating variables and trying to test these during PBL sessions did not fit with my aim to explore what facilitators and students did during PBL sessions. I knew that I wanted to observe facilitators in practice. However, having facilitated PBL sessions, I knew how different the sessions were from one session to the next, and how the group dynamics changed depending on the material being discussed, what was happening inside (e.g. who was chairing the meeting; who was hung over; who had prepared) and outside PBL (e.g. which assignments or exams were happening; which lectures or workshops were scheduled).

By providing research of a particular hybrid form of PBL, researchers and practitioners can compare and contrast how the structure of PBL and its practice within one context resemble PBL and practices elsewhere. PBL is spoken about as if it was a known and recognisable object, and I contest this claim. By describing how I observe different groups and facilitators practicing PBL within GEM, I hope to convey the message that PBL varies within a programme.

3.2.3 Issue of Generalisability

There is debate within the literature about generalisability in qualitative research. This term refers to the applicability of findings or theory beyond the context in which the research was undertaken. This has been

described as empirical or theoretical generalisability (Hammersley, 1992 as cited in Lewis and Ritchie, 2003, p.264).

Within the research literature on problem-based learning the issue of generalisability is complex. For one reason, while PBL can broadly be described as facilitated problem-first learning occurring within small-groups, the implementation of PBL across a range of disciplines and cultures has resulted in a variety of unique approaches sharing the PBL label (Barrows, 1986). Kelson and Distlehorst argue that 'PBL in medical schools has become a generic category encompassing almost any teaching approach that incorporates a patient problem in any format.' (2000, p.180) If there are many diverse practices that share the label PBL, how can research of these be generalisable?

Within a PBL programme, researchers face challenges relating to the generalisability of students' and facilitators' performance. Rather than being stable, the performance of students and facilitators varies depending on a variety of issues. Two examples include contextual factors (Gijselaers, 1997) and the productivity levels of the group (Dolmans et al., 1999). Therefore, the value of generalising across different groups of students and different facilitators, even within the same curriculum, may be questionable.

Within qualitative research, approaches to addressing issues of generalisability are debated (Bryman, 2004; Murphy et al., 1998). One alternative, as offered by Stake, is 'particularisation' that involves selecting:

> 'a particular case and coming to know it well, not primarily as to how it is different from others but what it is, what it does. There is an emphasis on uniqueness, and that implies knowledge of others that the case is different from, but the first emphasis in on understanding the case itself.' (Stake, 1995, p.8)

My research does not aim to make generalisations about PBL; rather, it aims to explore what different things happen during PBL sessions. I want to uncover the variability of PBL within an individual programme. I aim to do this by sharing my descriptions of a particular case, the hybrid curriculum at GEM.

While the diverse practice of PBL and variability of facilitation limit the ability to generalise, these factors support the description of contextual factors within PBL research. Trying to isolate specific variables when studying the practices of PBL and facilitation in order to achieve a sense of generalisability risks making the findings of the study meaningless by overlooking the richness and complexity of the setting, its actors and their activities (Norman and Schmidt, 2000). It is important to recognize that qualitative research offers a strategy that embraces the complexity of the situation.

When addressing the issue of generalisability, it is important to recognise that neither qualitative nor quantitative research strategies can independently offer complete solutions to research questions. Rather, each can contribute unique findings that can inform the work done within the range of research paradigms.

3.4 Research Design Decisions

There were theoretical and pragmatic reasons for adopting a case study approach in which I was a participant observer. My research aim was to understand the details of PBL practice within one specific setting by immersing myself in this environment. The case study approach fit my research aims. I was by default a participant observer as a result of the case I chose to study because I work as a PBL facilitator in the chosen research setting.

3.4.1 What is a Case Study?

Case studies have been defined in numerous ways (Stake, 1995; Yin, 2003). Some components of these definitions share similarities, while others highlight the different views held. One of the strengths of case study is that they 'investigate a contemporary phenomenon within its real-life context' (Yin, 2003, p.13).

Discussing PBL research, Norman & Schmidt identify:

> 'the advantage of a real environment is not that it is so messy with extraneous variables that we must randomize their influence away, but that it is so rich with other variables that we must capture these effects to truly understand the complexity of learning interactions.' (2000, p.726)

Case study is a research method that will enable me to do this. Stake (1995) provides the definition of a case study I've adopted for my research programme. Stake defines a case study as 'the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances' (1995, p. xi). Issues, rather than hypotheses are central to the conceptual framework of a qualitative case study (Stake, 1995, p.16). Whereas hypotheses minimise 'interest in the situation and circumstance', issues highlight 'complexity and contextuality' (Stake, 1995, p.16).

3.4.2 Ethnography

Ethnography is a method suitable for exploring the role of the facilitator within PBL. My research therefore aims to gather ethnographic data of facilitators within their natural environment that include PBL groups, staff briefing meetings and offices. This naturalistic approach, adopted from anthropology (Spradley, 1980) is a recognised method within educational research (Stubbs and Delamont, 1976) and medical education research (Atkinson and Pugsley, 2005; Becker et al., 1961; Sinclair, 1997). Becker et al. and Sinclair conducted their studies prior to PBL being introduced into

medical schools, a point recognised by Sinclair (1997). Therefore, my rationale for choosing to use ethnography as a method was influenced by this gap in the PBL literature (Leung, 2002; Sinclair, 1997). I found few studies that adopted observational methods (Conlee and Koschmann, 1997; Glenn et al., 1999; Koschmann and MacWhinney, 2001; Silver and Wilkerson, 1991; Tipping et al., 1995; Wilkerson and Maxwell, 1988; Wilkerson, 1991). I encountered papers discussing the need for research on PBL facilitation using observational methods (De Grave et al., 2002; Hak and Maguire, 2000; Leung, 2002; Rothman and Page, 2001).

While conducting my research, I considered my role as a ethnographer immersed in the setting I was studying (Spradley, 1980). I identified myself as a facilitator who was conducting research rather than a researcher who was facilitating.

Because I have worked in the research setting as a subject in my particular research interest, this has given me insider knowledge and access throughout the research process. This has influenced the research process and my understanding of my findings. It has given me 'direct experiential and observational access to the insiders' world of meaning' (Jorgenson, 1989 as cited in Ritchie, 2003, p.35).

3.4.2.1 Fieldwork

As an ethnographer at GEM, I had both formal and informal methods of collecting data. These are outlined in the following table:

Table 3.1 Formal and Informal Data Collection

Formal	Participant-Observer
	Video Recording PBL Sessions
	Audio-Recordings of CBM
	Field Notes
	Interview with facilitator
	Document Analysis
Informal	Personal Reflection on experiences at GEM
	Field Notes from personal experiences
	Informal Conversations with students and colleagues

The combination of these data sources informed the case study. More details are provided later in this chapter under 'Data Collection'.

3.5 Sampling

Using GEM as my research setting can be characterised as opportunistic sampling (Hammersley and Atkinson, 1995). My decision to research PBL and facilitation originated from my experiences of being a facilitator at GEM. Conducting my research was guided by a number of pragmatic factors which included gaining access to the research site, studying PBL in practice, enrolling participants, financial cost of conducting research,

balancing my research with work commitments. Selecting GEM as the setting made the research feasible. Many studies of PBL and facilitation have also taken place within the researchers' local environments (Rothman and Page, 2001).

I initially felt that conducting my research only at GEM would be a limitation of my research design. I was keen to explore aspects of facilitation across sites. As Murphy et al. discuss, other sampling methods like 'probability sampling'; 'non-random sampling for representativeness' and 'theoretical sampling' (1998, p.90) allow for empirical and theoretical generalization (Hammersley, 1992 as cited in Lewis and Ritchie, 2003, p.264). However as previously mentioned, my primary concern was exploratory research of the practice of PBL in a particular setting, rather than generalisability.

3.5.1 Access

Issues relating to access need to be addressed at different levels. I shall examine this in terms of informal and formal access.

3.5.1.1 Informal Access

As I was employed as a part-time facilitator, gaining informal access to GEM as the site of my research was straightforward. I had the support of senior academics from the beginning. Working as a facilitator gave me access to groups and first hand familiarity with issues arising. However,

this was limited to my own experience. I also had access to conversations that took place among core facilitators as an ethnographer. Many of these took place in the office I shared with colleagues and occurred immediately after PBL sessions. I also had access to the broader group of facilitators during PBL case briefing meetings, peer observation sessions, lunch breaks and training workshops and access to students both formally (e.g. during PBL sessions, mentor meetings) and informally (e.g. social gatherings, coffee breaks).

As GEM was a new school and using a novel PBL approach to teaching and learning, people were interested in researching what was happening. During the first year of GEM, the Institute for Research into Learning and Teaching in Higher Education conducted research that explored the students' experience of PBL at GEM. This study also used observational methods to gather data. Some facilitators at GEM had already been video-recorded and so my proposed methods for collecting data were already familiar. I believe this initial study helped to foster a research culture at GEM that encouraged the acceptance of my research.

3.5.1.2 Formal Access

This relates mainly to data collection, which occurred during the renal block May 2005 when I was audio recording PBL case briefing meetings and video recording PBL sessions. Prior to recording, I informed participants about the aims of my research and I obtained consent (See

Appendix 1. Healthy Volunteer's Information Sheet and Appendix 2. Healthy Volunteer's Consent Form).

3.5.2 Ethical Approval

The need to conduct ethical research within medical education is recognised (Morrison and Prideaux, 2001). However, the process of gaining ethical approval for qualitative research in medical education can be unclear (Lewis, 2003). The suitability of biomedical ethics committees to judge social research projects has been questioned and continues to be debated (Morrison and Prideaux, 2001). Previous qualitative studies of PBL and facilitators within medical schools have addressed the issue of ethical approval differently. Ranging from detailed accounts (Maudsley, 2002) to passing mention that 'members ... volunteered' (Wilkerson and Maxwell, 1988, p.893).

I applied for and gained ethical approval for my research from the University of Nottingham's Medical School Ethics Committee (See Appendix 3.). I reviewed my project and completed my statement of research ethics with the Research Ethics Coordinator in the School of Education. I have included details about recruiting and consenting participants to take part in my study in Section 3.5.3 and my reflections on ethical dilemmas I encountered while conducting my research in Section 3.10.

3.5.3 Timing of the Study

My decision regarding when to gather video-recordings and audio-recordings was influenced by my research question. What I sought to do was to observe PBL in practice. I wanted to look at what happened during PBL with experienced students.

I decided to collect my video and audio data during Block 6, which is the final PBL block of cases in Year One. I felt that this provided an excellent opportunity to collect data on PBL sessions at a stage when the students would have accrued nearly one academic year's worth of experience of working within GEM's PBL programme. By Block 6, the students had worked within two different PBL groups and with 5 different facilitators and experienced five blocks of PBL or approximately 25 PBL cases. At this point, I felt the students to be experienced in PBL.

My initial research questions were not concerned with observing how new students adjusted to or settled into a PBL curriculum. Therefore, I did not record sessions at the start of the year. This is also the busiest period of work at GEM as one group of students are starting their first year and another group is concluding their second year of pre-clinical work and leaving GEM to be based within the hospital environment. It is also the time when staff members are involved in double facilitation of year 1 and year 2 groups. I felt that scheduling data collection during this hectic period would have been unrealistic for me, and demanding on the staff members and students.

I considered collecting video data during a block in the second year; but I decided against this as I felt the students might feel less familiar with PBL after their 10-week summer break. Also, I believed that the pending summative exam might distract attention away from PBL sessions.

The length of Block 6 also influenced my decision. Being four weeks and consequently covering four PBL cases, I felt that it was feasible to collect enough, but not too much video data from a complete PBL block. This would allow me to observe a full block in its entirety.

The facilitators working within Block 6 were a mixture of core staff from GEM who had facilitated eight to ten blocks of PBL during the academic year along with facilitators who would be facilitating their first block of PBL. This mixture of facilitators is representative of the normal variety of 'core facilitators', academics and 'one-blockers' in any given block of PBL cases.

Block 6 also contained opportunities to explore a variety of issues relating to PBL practice and facilitation. I could observe how new facilitators joined groups of students that had been working as a team together for approximately ten weeks over the 2 previous modules. Collecting data during Block 6 provided me with an opportunity to observe facilitators with a range of experience working with PBL groups. For some facilitators, also known as 'one-blockers', this would be the first block they facilitated

a PBL group during the academic year. Other 'core facilitators' had worked with 5 or more groups during the academic year.

This was also a feasible period for me to develop my data collection skills. I was not scheduled to facilitate during Block 6. This would give me extra time to set up the cameras, consent the groups and facilitators, etc. However, I did end up facilitating in the end due to a last minute staff shortage. This was one of the hazards of being a participant-observer.

I was interested in collecting data about facilitators and students throughout all three sessions of a PBL case rather than only during one of the three sessions. I felt this would help me to explore issues relating to each of these sessions. For example, during session 1, I had heard and experienced difficulties with groups setting learning issues from the trigger text. During session 2, the process of feeding back learning issues was raised as challenging issues during CBM. During session 3, issues about reflecting on the process had been highlighted in the literature (Maudsley, 2002). Call have also been made to observe full cases (Hak and Maguire, 2000). While I felt excited to address Hak and Maguire's challenge, I was vaguely aware of warnings within the literature about the complexity of analysing observational data, especially video observations (Pink, 2001).

3.5.3.1 Possible Drawbacks relating to Study Timing

As the data was collected at the end of the academic year, the students and facilitators may have been fatigued with the PBL process. As this was the final block before the summer break, facilitators might have been distracted. Their formative exams and their reflective portfolios might have distracted the students. Because the data for each group and facilitator was collected over one case lasting one week, the group might not have been performing as normal. These factors can inform the findings.

3.5.4 Designing my Study

In designing my study, I decided to video record two groups simultaneously. I felt this approach would inform how different facilitators and groups engaged with the same PBL cases. It would help me to explore similarities and differences across groups within the same PBL curriculum. I restricted the number to two because I only had access to two cameras and tripods. Also, I wanted to be responsible for managing the recording equipment. I felt it was feasible setting up the cameras, initiating the recordings and changing tapes simultaneously across two different groups. However, trying to manage the responsibilities across three or more groups would not have been practical.

Block 6 contained four cases. Therefore, I expected to collect data from eight different PBL groups spread across these four different cases. Two groups would be recorded simultaneously during each case (Sessions 1, 2 and 3). This is illustrated in Table 3.2.

Table 3.2 Plan for Video-Recording PBL Sessions

PBL Case	Session	Camera 1 PBL Group	Camera 2 PBL Group
1	1		
	2		
	3		
2	1		
	2		
	3		
3	1		
	2		
	3		
4	1		
	2		
	3		

3.5.5 Recruiting and Consenting Participants

My decision to collect data in Block 6 influenced recruitment into my study. I could recruit from the pool of thirteen facilitators and the cohort of first year GEM students who were scheduled for that block of cases. Details about the facilitators scheduled for the block are provided in Table 3.3.

Table 3.3 Details of PBL Facilitators

Type of Facilitator	Profession	Base
One-blocker	Non-Clinical Academic (Biomedical Sciences)	Nottingham
One-Blocker	Academic (Medical Education)	Nottingham
One-Blocker	Academic (Clinical Medicine)	Nottingham
One-Blocker	Academic (Clinical Medicine/Med Ed)	Nottingham
GEM Academic	Academic (Medical Education)	GEM
GEM Academic	Healthcare Professional (Non-medical)	GEM
GEM Academic	Academic (Biomedical Sciences) & Medical Graduate	GEM
GEM Academic	Academic (Biomedical Sciences)	GEM
Core	Healthcare Professional (Non-medical)	GEM
Core	Healthcare Professional (Non-medical)	GEM
Core	Healthcare Professional (Non-medical)	GEM
Core	Healthcare Professional (Non-medical)	GEM
Core	Academic (Biomedical Sciences)	GEM

Before the module began, one of the 'one-blockers' was unable to facilitate. Because of this, I was assigned to a group. This reduced the number to twelve facilitators as I had decided not to video-record the group. I wanted to record as many different facilitators as I could. My approach to sampling was a mixture of opportunistic and purposive sampling. From this group of twelve facilitators, I wanted to recruit participants from across these varied groups of facilitators: One-Blockers, GEM Academics and Core Facilitators.

I decided to approach facilitators first because I felt that it would be a more efficient use of my time to explain my research and provide information about my study to one person. I met with facilitators individually to discuss my project and explore the possibility of video-recording them facilitating a PBL case. If they were open to participating in the study, I left them with an information sheet and a consent form to read (See Appendices 1 and 2). I provided them with at least 24 hours between our initial discussions and gathering their consent for being videoed. If the facilitator subsequently consented to take part, I then approached the group to explain my project, answer questions and gain consent. One possible criticism of this approach could be that I was affording the facilitators greater status or power in determining if a PBL group would be considered for the research project, as they were the initial filters to include or exclude participation.

I needed to recruit eight facilitators and their PBL groups. I decided not to video record myself in a group as I had already video recorded myself for the pilot study during the previous block of cases (See Section 3.8). I invited all twelve facilitators to take part in the project. One declined to be video-recorded. Of the remaining eleven facilitators who agreed to take part, only two felt comfortable being recorded during their first case with a new group. The other facilitators wanted to settle into their groups. This left me with six groups to recruit from the remaining nine facilitators.

I next approached the students in the eleven groups via email. Figure 3.1 contains a copy of the email I sent to the students.

Figure 3.1 Student Recruitment Email

Hello Everyone,

I'm emailing you and your group to ask whether you'd like to take part in a research project, which would involve video taping your group during PBL.

The project relates to research I'm doing on facilitation as part of my PhD in education. One part of my project involves collecting video during PBL sessions to better understand how facilitation occurs during PBL. I'm hoping to video tape one full PBL case (i.e. sessions 1, 2 & 3) during the Renal Block with various groups and facilitators throughout the block.

If everyone in your group agrees, I'd like to video your group starting on Friday during session 1 of the new case [Insert Module & Case Numbers]. I've spoken to [name of facilitator] and [he/she]'s willing to take part.

The reason I keen to video is to collect information about how PBL is actually facilitated during 'real' PBL sessions. I'm not doing the project to assess your individual performance or the group's. I'll be the only person who views the videos. If I find interesting clips that I'd like to use in future (e.g. for training), I'll show you the clip and ask for your permission. I've attached an information sheet that provides more details about issues like confidentiality and the overall project.

If you don't want to take part, that's no problem. If you could email me, I'll approach another group.

I'll come to your PBL group on Friday to answer any questions and to ask whether you are willing to take part.

If you'd like more info before then, please feel free to email me.

Thanks and talk to you soon,
Pete

While this method of gaining verbal or email/written informal and written formal consent was time consuming, I felt the process was worthwhile in that it provided numerous opportunities to answer questions from the staff and students about why the data would be of value, how the data would be collected, stored and shared, and who else would view data. This was also in line with recommendations from BERA (2004).

Each group contained either six or seven students. Of the eleven groups, students from three groups declined to be video-recorded during PBL. Therefore, I recruited a total of eight facilitators and eight groups.

I next scheduled the data collection. For PBL Case 1, I scheduled the two facilitators and their groups who were willing to be video-recorded for the initial case. My decision on how to schedule the remaining six slots was guided by various factors. One related to how quickly the student groups responded to my emails. These responses came at different times. Therefore, when I had positive replies and consented students and their facilitator, I scheduled the data collection for that group as soon as possible. This helped to guide the structure. I was also keen to have different combinations of facilitators. This followed naturally from the timing of responses I received; and, consequently, I filled all the recording slots (See Table 3.4).

Table 3.4 Plan for Video-Recording PBL Sessions

PBL Case	Session	Camera 1 PBL Group	Camera 2 PBL Group
1	1	One-blocker Non-Clinical Academic (Biomedical Sciences) Nottingham	GEM Academic Academic (Biomedical Sciences) GEM
	2		
	3		
2	1	Core Healthcare Professional (Non-medical) GEM	Core Healthcare Professional (Non-medical) GEM
	2		
	3		
3	1	One Blocker Academic (Medical Education) Nottingham	GEM Academic Healthcare Professional (Non-medical) GEM
	2		
	3		
4	1	Core Healthcare Professional (Non-medical) GEM	GEM Academic Academic (Biomedical Sciences) & Medical Graduate GEM
	2		
	3		

3.6 Data Collection

I felt that issues relating to PBL and facilitation would best be observed within the context of the video-recorded PBL sessions. However, having attended weekly case briefing meetings as part of my work as a facilitator, I also planned to gather data from these (See Healthy Volunteers Information Sheet in Appendix 1.). I sought to audio-record these meetings. This was included within my study design. I consented the participants in the CBM. I thought this would provide beneficial data about the context within which facilitators practised. I initially set out to use the data from CBM as background data to my study. However, when I began listening to and analysing it, I became aware of how valuable this data was on its own. It captured facilitators sharing their experiences of working with students and also working together and learning together in ways that resembled descriptions of PBL (Barrows, 2000). These discussions from CBM resembled focus group discussions. However, they were naturally occurring within the setting. I develop this in more detail in the section on collecting audio data.

Being a member of staff at GEM, I also had access to informal conversations with other facilitators for example during lunch breaks. This data was critical to my fieldwork. I sometimes returned to my office to type field notes relating to these informal conversations. I checked with the participants whether I could use these conversations and field notes.

My role as a researcher was overt within GEM (Spradley, 1980). I met no resistance to using this data that was collected informally.

As a participant observer I spent a lot of time writing reflections of my own experiences as a PBL facilitator. I drew upon these personal reflections to supplement my data (Spradley, 1980).

Although initially focused on data collected by video-recording PBL sessions, I came to realize that this ethnographic case study would benefit from data collected from several sources. As I was conducting exploratory research, I felt that complementary data from several sources would provide a more complete overarching narrative of PBL at GEM (Goldman et al., 2007).

3.6.1 Video-Recording PBL Sessions

There is increasing use of collecting video data within observational research (Pink, 2001). The benefits of this approach for the researcher include 'greatly increasing the interactional detail that can be recorded' and provides the opportunity for repeated viewing (Goldman et al., 2007). This can enhance observational power, as the researcher is able to shift focus and attention each time the recording is watched.

I revisited the data regularly. These repeated observations provide new broad insights into what is occurring within the PBL sessions. Video

recording allowed me to observe sessions that were running simultaneously. Another advantage is that I observed and transcribed in detail specific 'events' (Zacks & Tversky, 2001 in Goldman et al., 2007) for later analysis.

Goldman et al. identify two primary aims collecting video data. Firstly, to provide 'a narrative account of some phenomenon' and secondly 'creating a data source' that can be revisited to provide data clips (events) for analysis (2007, p.15). They acknowledge that these two aims overlap. That has been my experience particularly when I incorporate data collected from other sources.

The practical advantages of collecting video data already alluded to include:

- Recording PBL sessions running concurrently. This could potentially provide opportunities to analyse data from two groups studying the same case

- Being able to repeatedly watch sessions in order to observe details I may have missed on a single viewing if I had been observing the sessions in person and recording field notes.

- Being able to collect observational data for my research project while simultaneously fulfilling my service commitment as a facilitator in the research setting.

3.6.1.1 Conducting Video-Observations

I set up the camera and tripod on top of a table in the corner of the PBL room. As I would not be present while the sessions were being recorded, I set the zoom on wide to capture as much of the room as possible. The field of view centred on the round table where the students and facilitators sat. Using this vantage point enabled me to capture activities occurring within the frame of the video camera. Fortunately, due to the relatively small size of the PBL room, it was unlikely that much activity would occur outside the field of view. I relied on the microphones in the camera for the audio recordings. The audio from these was clear and audible. Recording from this fixed position resulted in some limitations to the data I collected. In some cases I was not fully able to view students seated at the computers. During some sessions, one or two students or the facilitator had their back to the camera throughout the session. Sometimes the camera was positioned above the teakettle and occasionally the sound of boiling water and steam briefly clouded the activity within the group. However, this normally occurred as the groups were preparing or taking a break during the sessions.

I pressed record with the intention of letting the camera run throughout the session. The camera remained in this fixed position throughout the recording. In most of the sessions, I returned to stop the camera at the end of the session or to change the tape during PBL Session 2, which was scheduled to run two hours. This was longer than the length of the 90-minute videotapes I used when recording.

As I was recording two PBL sessions concurrently, I aimed to set up the first camera and begin recording approximately ten minutes before the session started. This gave me time to get to the other PBL room to set up the second camera and begin recording before that session began.

As a result of this, the recordings from the first groups I set up captured the build up or the process of what was happening prior to PBL officially starting: the students and facilitator arriving into the classroom, making hot drinks and chatting, students using the computers, etc.

These recordings provided some insight into how the group responded verbally to being videoed. The responses varied. Sometimes students would wander into a session and not know that they camera was running. Other students might call out a warning such as, 'Be careful, you're on camera!' Other times, students might speak about the process to each other sounding perplexed, 'Pete is videoing us making tea.'

I had considered asking the facilitators or students to press the record button at the start of the PBL sessions. However, I felt it was my responsibility as the researcher to ensure that the cameras were recording. I felt concerned about the possibility of missing PBL sessions in case the facilitator or group forgot to start the camera. As a result of this decision, I recorded a lot of data prior to the start of PBL sessions. In my initial plan, I hadn't considered this as valuable information, but it did prove to contain useful data that I discuss in the findings chapters.

3.6.1.2 Data Management

Each mini digital video cassette used for recording was labelled using the following format: GEM Group (Number), Date, PBL Case (Number) and Session (1, 2A, 2B or 3). I then transferred each of the recordings from cassette to DVD. Each DVD was labelled using the same format as the cassettes (Figure 3.2).

Figure 3.2 Labelling of Video Data

GEM Group A	07 June 2005
PBL Case 1	Session 2B

I reference findings from the video-recordings using the format provided in Figure 3.3.

Figure 3.3 Referencing Video Data

(Group A, PBL Session 1, 10:14:08) (PBL Group, PBL Session, Start time of excerpt)

These DVD's were organised into a folder according to the sequence of PBL cases and sessions. This library of DVD's provided flexibility to view the data on a variety on computers or via DVD players and television. It also served as a back-up system for the mini digital videocassettes. The original recordings were stored in a locked cupboard separately from the DVD's and viewed in locations where only I had access to the viewing equipment in order to preserve confidentiality. I used the system described above to reference the recordings to PBL cases and Groups and relate them to the corresponding case briefing meeting recordings.

As I undertook my research, I developed new skills using video as a data collection tool. Using equipment available at GEM, I constructed a 'video-editing suite' in what others referred to as a 'cupboard' in the clinical skills area. This room provided a secure place to transfer material from miniDV tapes to DVD-R discs.

3.6.2 Audio-Recording Case Briefing Meetings

Some of the theoretical arguments for collecting video data also apply to audio-recording. The data collected from CBM provided a larger narrative

of the facilitators' experiences in PBL sessions. However, specific clips could be transcribed and analysed in detail and used to supplement the events captured on video. Like the video data, I could repeatedly listen to the audio-recordings.

Gathering audio data was less intrusive than gathering the video recordings. Participants frequently commented about being video-recorded during PBL (e.g. 'Big Brother is watching' and 'Can we turn off our little friend?'). However, nobody mentioned the tape recorder during CBM. The group discussions during CBM appeared to naturally evolve with facilitators sharing their experiences from the groups when asked by the chairperson, 'How are your groups doing?' This was a normal activity that occurred most weeks within the CBM. It was better than a focus group, as discussions occurred naturally rather than as part of a separate research activity.

I used a small tape-recorder from GEM to audio-record the sessions. This sat in front of me during the CBM. After recording these I transferred the files from cassette to digital files on the computer using Audacity software. I assigned labels to the audio-visual data I incorporated into my findings chapters. I used the following formats to organise the audio recordings:

Figure 3.4 Labelling and Referencing Audio-Recordings

CBM[a]	6_2[b]	RV 6_1[c],	12:01[d]

a. Case Briefing Meeting

b. represents the upcoming case being briefed

c. represents the case being reviewed

d. represents the timing when the excerpt started

This format was used to reference findings from the audio-recordings.

3.6.3 Collecting Field Notes

My field notes served several purposes. They supplemented the audio-recorded data gathered during CBM. They also provided a record of who was present at CBM, the dynamic of the group and prompts for further fieldwork and analysis. My field notes also included events that were not recorded via audio-visual methods. Examples of these include conversations with facilitators after a PBL session and issues arising within the PBL groups I was facilitating. I spent a lot of time in the field not using a video camera or tape recorder to gather data. I was at GEM as a facilitator, but I was always aware that what was happening could be potential data. I recorded my field notes in notebooks, which were organised according to dates. These were stored outside the research site. I read these repeatedly and these informed my analysis as I watched and listened to my audio-visual data.

3.7 My Approach to Analyzing Data

The theoretical background to my data analysis was informed by the Inductive-Iterative approach (O'Reilly, 2005) that I adopted. I sought to immerse myself in the data and become very familiar with the themes that were emerging. During the initial stages of the analysis, I repeatedly viewed and listened to the audio-visual data and recorded broad themes and details of specific events for deeper analysis. I constantly alternated between analysing the audio-visual data. At times the audio-recordings of CBM guided my analysis of the video-data from PBL. At other times, themes arising from my video-data guided my analysis of the audio-recordings. Equally field notes from informal conversations and my own experiences as a participant observer prompted me to analyse the audio-visual data with specific themes in mind. For example, during PBL session one, I frequently encountered students bypassing the process of generating their own learning issues steps in the PBL process. I searched the data from all the sources described to explore this theme in depth.

I did not transcribe the whole corpus of audio-visual data as it was a huge volume (Goldman et al., 2007). After initial viewings, certain themes emerged. I then chose themes that I repeatedly experienced as a facilitator and heard being discussed during PBL sessions. Thematic choices were also influenced by my understanding of educational theories and research literature relating to PBL. For example, in the findings I

discuss aspects relating to students' self-directed learning and facilitators' levels of content expertise. Having focused on specific themes, I then returned to the data to select and transcribe specific events that related to these themes.

Some of the themes that I excluded from further analysis (due to the large volume of data I had collected) included 'students not attending to psycho-social issues' and 'social aspects of life inside the PBL room'. These would make interesting themes for future research.

3.8 My Pilot Study

I was familiar with recommendations to undertake a pilot study prior to the primary work (Phillips and Pugh, 2000). Between January and February 2005, I undertook a pilot study. This involved collecting video data from a PBL group I was facilitating. I discussed my idea for a pilot study with the students. They agreed to take part. When we began recording later that week, I asked the group on tape to give their consent. My pilot involved gathering video data of initially three PBL sessions (e.g. Sessions 1, 2 and 3) or one full case.

There were many benefits of conducting this pilot study. Knowing these students allowed me opportunities to practice and develop confidence in a number of steps in the research process. These included explaining my

research and my rational for wanting to video PBL sessions and gaining consent. The experience also provided me with opportunities to familiarize myself with collecting the data: setting up the tripod and programming the camera, loading tapes, positioning the camera and labelling the tapes.

I began to experience the inductive and evolving nature of qualitative research. When I first conceptualized my research, I had a clear view that I wanted to explore the facilitation of PBL. As I progressed through my data collection, I began to identify many more themes emerging and constructed a far more complex overarching narrative.

During the first morning, I had negotiated with the group about starting the camera during the final session 3. I felt this would help them get used to the idea of being videoed. That way when I was going to start videoing 'for real' during the next case, I could review with the group how they felt about being videoed and explore any issues that arose. At the end of the planned data collection, the group was open to me gathering me more data. I continued videoing the group during the next case, another 3 sessions.

Reflecting on this experience, I realised that this was not a thorough pilot study. While I did collect some video data of PBL sessions, the pilot stopped there. The data remained on the original tape for the next year. I

didn't practice transferring the Mini DV to a DVD-R during the pilot. I didn't follow through with a complete analysis of the data. This was mainly due to time constraints as I was planning and initiating the full study.

I think many of these faults stemmed from me underestimating the time necessary and to plan and prepare for the pilot study. Thinking I had conducted a pilot, may have led me to feel mistakenly secure in my research design and data collection plan. However, many new issues arose when I went to collect data for my study. Each of these prompted me reflect back on why had not I encountered this during my 'pilot study'?

For example, I was gaining consent from students in PBL groups. Some of whom I had never met. I emailed them with information about my study and included attachments of the consent form and information sheet. I then visited their groups a few days to collect or get the consent forms signed. This was a very different experience than that of gaining consent for the pilot study from a group of students I was facilitating. I had already established a strong relationship with the students in 'my group.' They appeared enthusiastic to take part. As I did not have such a familiar relationship with students in the other groups, the process of consent felt more formal. Some students, though willing to take part, seemed indifferent. This is understandable as their attention and priorities were on studying rather than being studied.

Also during my pilot, I worked with just one group. I faced a challenge during my full study of collecting video data from two PBL groups in different rooms and sometimes on different floors at GEM.

Where previously two cameras had been available at GEM, one was discovered to have gone missing the week before I was going to begin my primary data collection. I borrowed a DV camera from a friend. As this was a different brand and model than I had used, this raised some challenges the first time I used it. This was a technical difficulty I had not anticipated after conducting the pilot study.

3.9 Reflexivity

Being a facilitator and researching facilitation at GEM has been challenging. While I am immersed in the day-to-day lives of facilitators as a facilitator, I also feel different as I am driven to observe and record what is happening. I have taken part in training sessions, social gatherings, while sharing an office space with other facilitators, mixing with them outside of PBL and attending briefing meetings.

As a novice researcher, I faced the challenge of moving beyond my identity as a facilitator and the accompanying beliefs and bias I held about how facilitation 'should' or 'does' occur. My ideas about facilitation

shifted as I gained experience as a facilitator. These, in turn, have influenced me in my role as a researcher at GEM.

'Going native' is one issue frequently discussed within the qualitative research literature (Richie and Lewis, 2003; Bryman, 2004). It relates to researchers losing their 'research' identity, getting absorbed into the culture they are studying and losing their objectivity (Murphy et al., 1998). 'Going native' is seen as a risk to the researcher's findings. However, I recognized that I was already a native before starting my research. The challenge I have faced has been to balance the benefits of being a native like accessibility and insider knowledge with the possible hindrances on my ability to view my data with a fresh perspective and be open to new insights and surprises in the data.

Another limitation of conducting research at GEM relates to the challenges I faced of learning to become a facilitator while also learning to become a researcher. I felt particularly challenged when working with 'difficult' or poorly functioning groups. When I felt frustrated, I would question whether facilitation was worthwhile. These thoughts then sparked me to question my reasons for researching facilitation, which at times, felt like a 'waste of time.' Similar challenges have been reported elsewhere (Hendry et al., 2003).

At other times, I felt enthusiastic to be closely engaged with the two

disciplines of facilitation and research. I felt encouraged to find that I was developing my knowledge and skills in both areas simultaneously. I regularly felt this excitement while critiquing papers for my literature review. From a research point of view, I was developing skills in critiquing arguments, qualitative methods and ethics. At the same time, I was expanding my knowledge of issues faced by facilitators and suggestions to improve practice and training (See Section 4.5.2.1 for an example of this). I continue to regularly experience the ups and downs of researching an area with which I am closely involved.

3.10 Ethical Reflections

Within this section I describe some of the ethical dilemmas I encountered while conducting my research. I also reflect upon my responses.

3.10.1 Ethical Issues regarding Consenting Participants

Interesting issues around consent arose. Even though the facilitators and students had consented to being recorded, sometimes they walked into the sessions when the research process had already begun. They might not have been aware of the camera recording them. On one occasion the facilitator appeared shocked after being reminded a student that the camera was running; she exclaimed, *'Oh Pete has already been in? The camera is running!? Ohhh, ohh!'*

While nobody came back to me to object to this approach, I think this influenced how the facilitators and students responded to the presence of the camera. It was at times, treated in a similar fashion to Big Brother - a television programme that was popular while I was collecting data. Students and facilitators regularly made references about the camera as illustrated here, 'Fac. E: Oh, (the camera)'s going is it (Turning to look at the camera)? We're on Big Brother then. (PBL Group E, Session 2A, 08:07:16).

3.10.2 Ethical Issues relating to Video Methods

I encountered challenges during the course of the research. While managing the data I collected I encountered various unexpected ethical dilemmas. In this section, I will describe two examples and reflect on how managing these experiences shaped my research. These two examples both relate to sharing video clips of data I collected in PBL groups with a larger audience.

While recording a PBL session, one student accidentally kicked another student in the groin. After both of the students had recovered from the emotional and physical shock, the group returned to focus on the case. At the end of the session, the students were very keen to replay the video. Capturing this critical incident on film provided a lot of laughs for the students.

A couple of months after this, one of the students in the group approached me. He asked me if he could use the clip during the end of year student revue the students were organising. He thought it would be the highlight of the evening. Especially as rumours of the incident had circulated around the students but nobody outside the group had seen what happened. From the perspective of a facilitator, I could see the humour around the situation and could understand the student's keen interest to include the clip. However, I was able to step back and consider the ethical implications of this as a researcher. Even if I had checked that the students involved had given their approval, I felt that sharing this clip with the students would not have been in line with ethical practice. What message would that send to the other students who consented for the study? Could they feel concerned about other clips appearing? This also raised issues about students having some ownership of the data. I shared my reservations with the student who requested to use the videos. I felt in this case that declining would prove less harmful to the students.

Another ethical issue arose when I was showing a video clip to a group of facilitators for training purposes. The facilitator and students I had videoed provided consent for me to share some clips. However within the video, the group made reference to the styles previous facilitators had adopted. I had edited the clips when the students mentioned the names of the two facilitators in order to maintain their anonymity. While showing the group of facilitators this clip, one of the facilitators became upset

when she heard the students describing the experiences they had with their previous facilitators. While I had felt confident that I had protected the identity of the facilitators who were mentioned from other facilitators, I had failed to consider whether the facilitators to whom the students referred would recognise themselves. Using hindsight this would have been difficult to do as the student mentioned 'we've had two facilitators.' While watching the clip, the facilitator who had worked with the group would have recognised them. She would have then known one of the descriptions pertained to her.

The dilemma did not stop there. The facilitator was keen to view the unedited clip as she felt hearing the feedback would be beneficial. I could understand her reasoning. However, I did not feel entitled to do this without gaining the consent from the student. I contacted the student to explain the situation and asked if she would be willing for me to show the clip in full to the facilitator. She agreed. I watched the clip with the facilitator. This closely resembled the clip I had shown during the training session except for the facilitator being mentioned by name.

This experience helped me to recognise the challenge associated with sharing video-clips with others. If I had provided transcripts of the discussion, I could have secured the anonymity of facilitators and students. This experience influenced my decision to use transcripts when presenting my findings in my thesis rather than include video clips.

3.11 Conclusion

This chapter has explored the factors that influenced the design of my research and the methods used to collect and analyse the data. In the next chapter, I will begin to lift the lid on the practice of PBL at GEM.

Chapter 4: Lifting the Lid on PBL at GEM

4.1 Introduction

Over the next three chapters, I present findings relating to this ethnographic case study of PBL at GEM. The findings are presented in two different ways. As discussed in the chapter on methodology, my chosen research design combines several avenues of data collection. This combination lends itself to providing, firstly, an overarching narrative or story of PBL at GEM; and, secondly, a more detailed analysis of themes or "events" emerging from the data.

In the first chapter, I describe the research setting, the participants and the processes at GEM as witnessed through my role as a participant-observer and recorded in my field notes. I also draw upon documents and audio visual data collected during the research period. The following two chapters centre around two main themes: firstly (Chapter 5) self-directed learning as an educational process within PBL at GEM (examined through four main findings) and secondly (Chapter 6) the identity and role of facilitators at GEM.

In this chapter I aim to familiarise the reader with an overview of the setting where I conducted my research. I also present a detailed examination of PBL within this hybrid curriculum. Within the literature

review, I identified the difficulty in using the phrase 'Problem-Based Learning' to describe a specific educational method. This inadequacy is due the variety of educational approaches that share the label of PBL (Barrows, 1986; Kelson and Distlehorst, 2000). Within this chapter I will describe the 'official' characteristics of GEM's hybrid version of PBL as described within course policy documents. In doing so I will clarify the intended aims of PBL within my research setting. In subsequent chapters, this 'official' version of PBL will be an important point of reference as I explore the complexities of PBL in practice.

4.2 Establishing GEM

GEM was established in 2003 as a graduate entry, four year, fast track programme linked to the existing undergraduate medical school at the University of Nottingham under the government scheme to expand training for undergraduate medicine within England (See Sections 1.4.1 & 1.4.2). Students enrolled in the GEM programme spend the first 18-months based in the medical school in Derby. The first academic year begins in September and finishes in June. The second academic year begins in September and finishes the following February. After successfully completing the programme, GEM students integrate with the undergraduate medical students who are enrolled on the five-year course at the University of Nottingham. Thus, the University of Nottingham has two parallel programmes that converge for the final 2.5 years on the

clinical practice course. The combined cohorts attend clinical training attachments based at sites across the Trent deanery. Upon graduation students from both programmes receive BMBS degrees from the University of Nottingham.

4.3 The PBL Curriculum at GEM

> 'The PBL element . . . is at the heart of the GEM course educational process.' (GEM, 2003b, p.15)

The GEM curriculum contains two main programme themes: Basic and Clinical Sciences (BCS) and Personal and Professional Development (PPD) (GEM Course, 2003). The PBL curriculum was licensed from the University of Sydney in Australia. The PBL cases were then modified by academic staff in Derby to incorporate both the BCS and PPD themes. The cases were also altered to reflect healthcare as practiced within the NHS in England as opposed to Australia. The process of adapting the Sydney course to GEM involved developing taught components to complement the PBL cases. As a result the curriculum at GEM is a mixture of imported but adapted PBL cases and locally developed taught components. This point is explored further in Chapter 5 when I highlight the interplay between these in the context of students' development of self-directed learning.

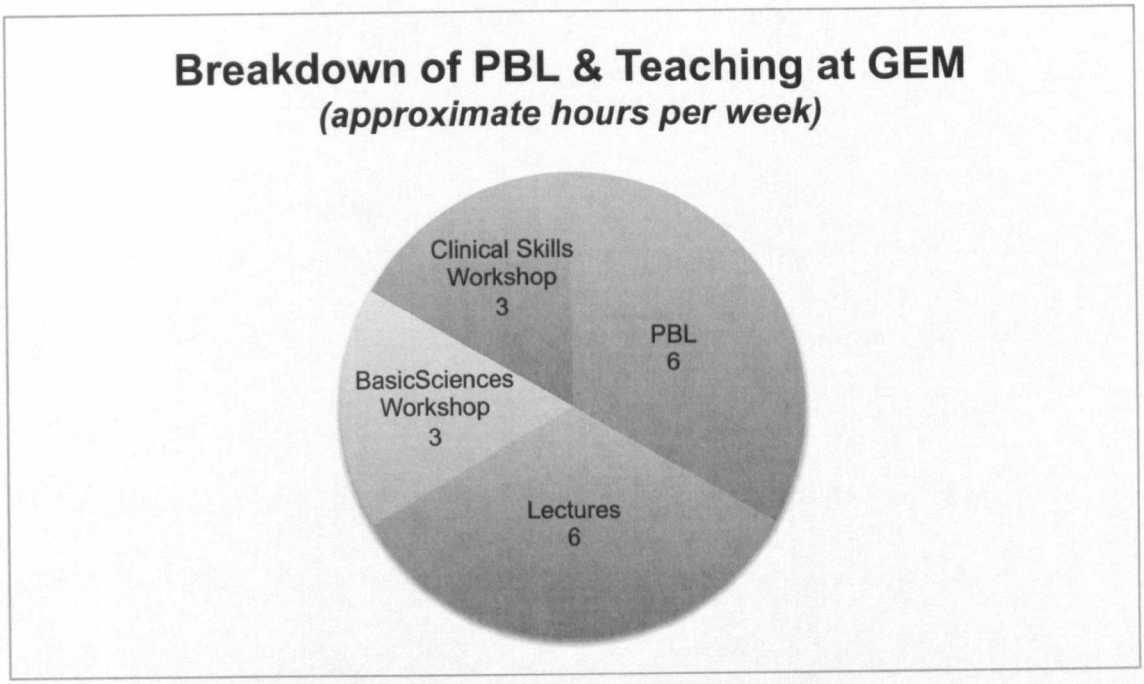
Interestingly, GEM is described as a 'PBL course' (GEM, 2003a) despite the fact that it incorporates a range of educational approaches in addition to PBL:

> 'The PBL process is supported by a number of additional taught classes – lectures, practicals and seminars – directly geared to the scientific ... and professional issues that the weekly problem raises.' (GEM, 2003a, p.7)

Taught sessions include lectures in basic and clinical sciences (e.g. anatomy, physiology, pharmacology) and behavioural sciences; clinical skills and professional development workshops; and early clinical experience placements within General Practice. An example of the weekly schedule for first year students at GEM is provided in Appendix 4. The following chart provides an approximate breakdown of how many hours per week students spend within PBL and taught sessions. While these taught resources complement the topics being covered during the PBL cases and support students' learning. However, they also create a tension relating to how students develop skills in self-directed learning[10].

[10] This is explored in Chapter 5.

Figure 4.1 Breakdown of PBL and Teaching at GEM



An important point to highlight is that these 'additional taught classes' are intended to support the PBL process:

> 'The purpose of these classes is to complement the independent learning via PBL by providing overviews and orientation, exposition of difficult conceptual aspects and related practical experience.' (GEM, 2003a, p.7)

However, the extent to which these 'additional taught classes' are intended to support the PBL process is variable: 'In some places students will be able to attain planned learning outcomes largely via the taught classes alone' (GEM, 2003a, p.7). Here we begin to see interplay between the PBL sessions and the taught classes within which students may be able to rely upon the taught classes to supplement or even substitute the intended self-directed learning associated with the PBL case. In the

following chapters, I will explore this interplay further. However, at this stage, I am keen to simply highlight the point that a range of educational approaches is used at GEM with the stated intention of supporting PBL.

4.3.1 GEM's Hybrid Version of PBL

The curriculum at GEM can be described as "hybrid", a model within which PBL is supported by taught sessions (Barrows, 1986). The rationale for adopting a 'hybrid' form of PBL is related to the shorter 18 month time span that GEM students have to demonstrate 'vocational competence' compared to the undergraduates studying on the five year course in Nottingham, who have 24 months to meet the learning objectives[11].

A footnote in the Educational Policy and Curriculum Specification explains this:

> 'NB The GEM course manages the tension between the need for attainment of vocational competence (e.g. basic science outcomes) and the adult learning model underpinning PBL by using an epistemological version of PBL in a hybrid approach.'
> (2003a, p.6)

This hybrid model of PBL was felt to better suit the 'fast-track programme' (GEM, 2003a, p.7) at GEM as it was felt that students within a pure PBL curriculum may require more time to meet the intended learning

11 The teaching approaches used during the first two years on the undergraduate medical course in Nottingham primarily involve lectures and taught workshops. There is no PBL component.

objectives (Albanese and Mitchell, 1993). I provide discussion about this in the final chapter.

4.3.2 Aims of PBL at GEM

The aims of the PBL programme at GEM are that the students will learn about key biomedical, psychological and social aspects of medicine that are embedded within the context of patients' presenting complaints and subsequent journeys through the NHS. PBL is also intended to meet outcomes outlined within Tomorrow's Doctors (See Table 4.1).

Table 4.1 Outcomes from Tomorrow's Doctors

- Good clinical care, including knowledge, skills and professional behaviours required to practice safely and effectively
- Maintaining good medical practice. This includes how to keep up to date and be an effective lifelong learner.
- Relationships with patients. This refers to effective communication with a respect for person based on the moral and ethical foundations of current medical practice.
- Working with colleagues in an increasingly inter-professional setting, demonstrating effective team-working and leadership as required.
- Teaching and training. Be willing and able to teach colleagues.
- Probity or demonstrating honesty.
- Personal health. This concerns awareness of health hazards of medical practice and the importance of maintaining personal health in order to practice safely and effectively as a doctor.

(GMC, 2003, pp.7-9)

4.4 The Structure of PBL at GEM

The academic year at GEM is organised around 'Blocks' rather than semesters. Each block lasts between four and eight weeks. Beginning with an introductory foundation block, each subsequent block then focuses on a specific body system such as the musculoskeletal, respiratory, cardiovascular, gastrointestinal, renal, endocrine and neurological systems.

The PBL cases relate to each of these systems. Each case is centred on a description of an individual patient who presents to his or her General Practitioner (G.P.) or the hospital. This vignette is referred to as the 'trigger text' (See Section 4.4.1). For example during the cardiovascular block, one patient presents with chest pain and is later diagnosed as having a myocardial infarction (a.k.a. heart attack). Another case in the block focuses on hypertension (a.k.a. high blood pressure).

Rather than being presented in the form of a syllabus, the curriculum is gradually released to the students via the PBL cases as the block progresses. While the students will be aware of the focus of each block (e.g. the cardiovascular system), they will not necessarily know what specific aspects like myocardial infarction will be covered during that week until they begin working through the PBL case. This creates a sense of ambiguity where students may not be certain about what they are

intended to learn when a case begins and tensions may arise from this. I will later explore how students and facilitators respond to this ambiguity and highlight some of the tensions that arise within the Hybrid PBL curriculum at GEM (See Sections 5.2 & 5.3).

Each PBL case is studied over three sessions during the course of a week. These sessions are held on Tuesdays and Fridays. Each session has different official tasks, which are discussed in the following sub-sections.

4.4.1 PBL Session 1

In PBL Session 1, which is scheduled to run between 11:00 am and 12:30 pm on a Friday; students meet the patients via the 'Trigger Text' (Figure 4.2). This communicates the presenting complaints and other clues or 'key words' about the individual's condition to the students. It is approximately five to seven sentences in length and one or more photos of the patient accompany the text.

Figure 4.2 Trigger Text

'Mr Graham Brown is a 66-year-old widowed pensioner who has been brought to the local hospital after being found at home by his daughter lying on the bathroom floor.

His daughter says that he was confused and unable to coherently explain what had happened, but she was able to find out that her father had tripped and fallen heavily against the bath, about 48 hours previously. He said he felt an immediate pain in his right hip and was unable to move. His daughter called a doctor straight away, who arrived within 30 minutes, commenced an infusion of intravenous saline and arranged for an ambulance to take Mr Brown to the hospital.

On admission he was intermittently confused and complained of pain and swelling in his right leg. His blood pressure was found to be low, and on catheterisation of his bladder, very little urine was drained.'

An image accompanies the text with the following description: *'A man in his sixties with two days' growth of beard, connected to an intravenous drip as he lies in a hospital bed, his daughter next to him.'*

(GEM PBL Case 6.2)

The students access the trigger text via a website on the computer. By clicking upon an image on the webpage, they can hear a recording of the trigger text being read by a staff member. Groups adopt different practices of listening to the trigger texts. For example, I have observed students writing notes as they listen to the text being read. When the reading stops, the students begin calling out important key words or ideas to another student, the 'scribe', who is standing in front of a white board ready to record information. Many groups use spider-diagrams or mind maps to record 'key words' from the trigger text and also to organize their ideas. Sometimes groups may choose not to write down any notes, but rather listen to the text being read. Afterwards, they attempt to recall information presented in the trigger text and relay this information to the scribe. Students can listen repeatedly to the trigger text. They normally do

so in order to ensure they have not missed any information.

Occasionally the students have trouble accessing the trigger text. This may be caused by a problem with the computer network. When this situation arises, the facilitator may read the trigger text to the students from their facilitator guide.

4.4.1.1 Learning Objectives, Learning Topics and Learning Issues

In this section, I discuss issues relating to Learning Objectives, Learning Topics and Learning Issues. To provide clarity, I will define what these terms mean within this specific educational context.

Learning Objectives are phrases that relate to 'core objectives' on the Bachelor of Medical Science course at Nottingham (GEM, 2003a, p.51). Learning Objectives are mapped onto each PBL case by faculty at GEM with the intention that students progressing through the set of PBL cases over the 18 months of study at GEM would for the most part cover the curriculum objectives on the pre-clinical course at Nottingham.

The following list provides a selection of Learning Objectives that are assigned to a PBL case involving a patient suffering from liver failure:

- Liver structure and function
- Toxic injury to the liver
- Systematic effects of chronic alcohol abuse
- Viral Hepatitis

(GEM PBL Case 5.4)

Learning Objectives are not made available to students at the commencement of the course nor at the start of the PBL cases. Learning Objectives are released to students at the end of PBL Session 3 and contained within a summary of the PBL case.

Learning topics, on the other hand, have been formulated by faculty as learning resources for students to access during each PBL case. While I was collecting the video-recordings of PBL at GEM, the titles of the learning topics were released to students at the end of PBL Session 1, these resources are provided to students to guide their learning. The learning topics, in many instances, may overlap with the learning objectives. However, the list of learning topics is not intended to be a comprehensive summary of the curriculum. Each case contains between seven to ten learning topics. These are phrases that are selected by the faculty to highlight some of the key points each PBL case is intended to

cover. Table 4.2 demonstrates how they map on to a case.

Table 4.2 Examples of Learning Topics

PBL Case 6.1	Learning Topics
'Washed Out'	Normal and abnormal hydration Fluid homeostasis and the kidney Filtration and reabsorption in the kidney Consequences of hypokalaemia Diuretic complications and abuse Hyponatraemia Principles of IV fluid and electrolyte replacement therapy

An additional term introduced in the thesis is "Learning Issues". This refers to the list that students generate during the course of a PBL case. The students' list of learning issues encapsulates the learning that they decide they want to cover[12] and is intended to guide their self-directed learning between PBL sessions. After hearing the trigger text, students begin a process of brainstorming. During PBL Session 1, students are expected to think broadly, clarify unknown terms and develop learning issues to research.

[12] In Chapter 5 the tensions that can arise between student-generated learning issues and faculty-generated learning topics is explored in depth as a key finding in this study.

An important dilemma for facilitators is whether or not to steer students towards identifying these faculty-derived learning topics during the first PBL session of a case or whether to encourage them to follow their own list of learning issues. The students are expected to research the issues or topics outside PBL sessions and feed back their findings to the group during the second PBL Session.

In addition to the learning topics, there are a number of clues within other parts of the GEM curriculum that sign-post learning topics to the students. These include the lecture timetable, the workshop timetable and a library resource list. The lecture timetable is openly available to students and provides a list of lectures that will be delivered throughout the year. As the lectures aim to support the PBL cases, the timetable can guide students as they identify learning issues. This strategy can cause problems if a lecture has been rescheduled and relates to a previous or future PBL case, but the timetable normally relates to the current PBL case. Again the interplay between how students use the components of the curriculum outside PBL and PBL itself is explored in detail in Chapter 5. Table 4.3 below demonstrates how lectures map on to a PBL case.

Table 4.3 Learning Topics and Lectures Assigned to PBL Case

PBL Case 6.1	Learning Topics	Lectures
'Washed Out'	Normal and abnormal hydration Fluid homeostasis and the kidney Filtration and reabsorption in the kidney Consequences of hypokalaemia Diuretic complications and abuse Hyponatraemia Principles of IV fluid and electrolyte replacement therapy	Urinary Tract Hyper- and Hypovolaemia Glomerular Filtration Nephron transport processes: overview Diuretic agents Regulation of renal sodium transport

4.4.2 PBL Session 2

During the second session of a PBL case, timetabled for Tuesdays from 9:00 am to 10:30 am, students share learning issues that they have researched. The students also have opportunities to obtain the patient's history, discover examination findings, and discuss which investigations they would like to undertake to help manage the patient. The facilitator is provided with a 'Facilitator Guide' for each PBL case[13]. Each guide contains a list of findings. This is information that would be collected by a doctor when taking a patient's history, performing an examination or undertaking investigations. The students do not have access to this written information independently until the conclusion of the case. Within a group the students and facilitator decide how this information should be

[13] See Section 4.5.2.3

discovered. Through my video data and participant observation, I have seen this done in various ways. Sometimes the facilitator will role-play the patient and the students will role-play the doctor and elicit information (Menahem and Paget, 1990). Sometimes the facilitator will give the students the written information for one of them to role-play the patient. Other facilitators will read the information off the sheet. Sometimes they will field questions from the students and only release the information on the sheet if the student provides sufficient justification for requesting the information. This particularly relates to justifying investigation requests or proposed treatment plans. This practice of role playing is not widely recognised within the literature on PBL.

4.4.3 PBL Session 3

In this final session of the case set for Friday mornings between 9:00 and 10:30 am, students discuss outstanding learning issues, explore test results and management plans and reflect on the case and how the group has worked during the case. Three PBL sessions constitute one PBL case; a case equals a complete clinical story.

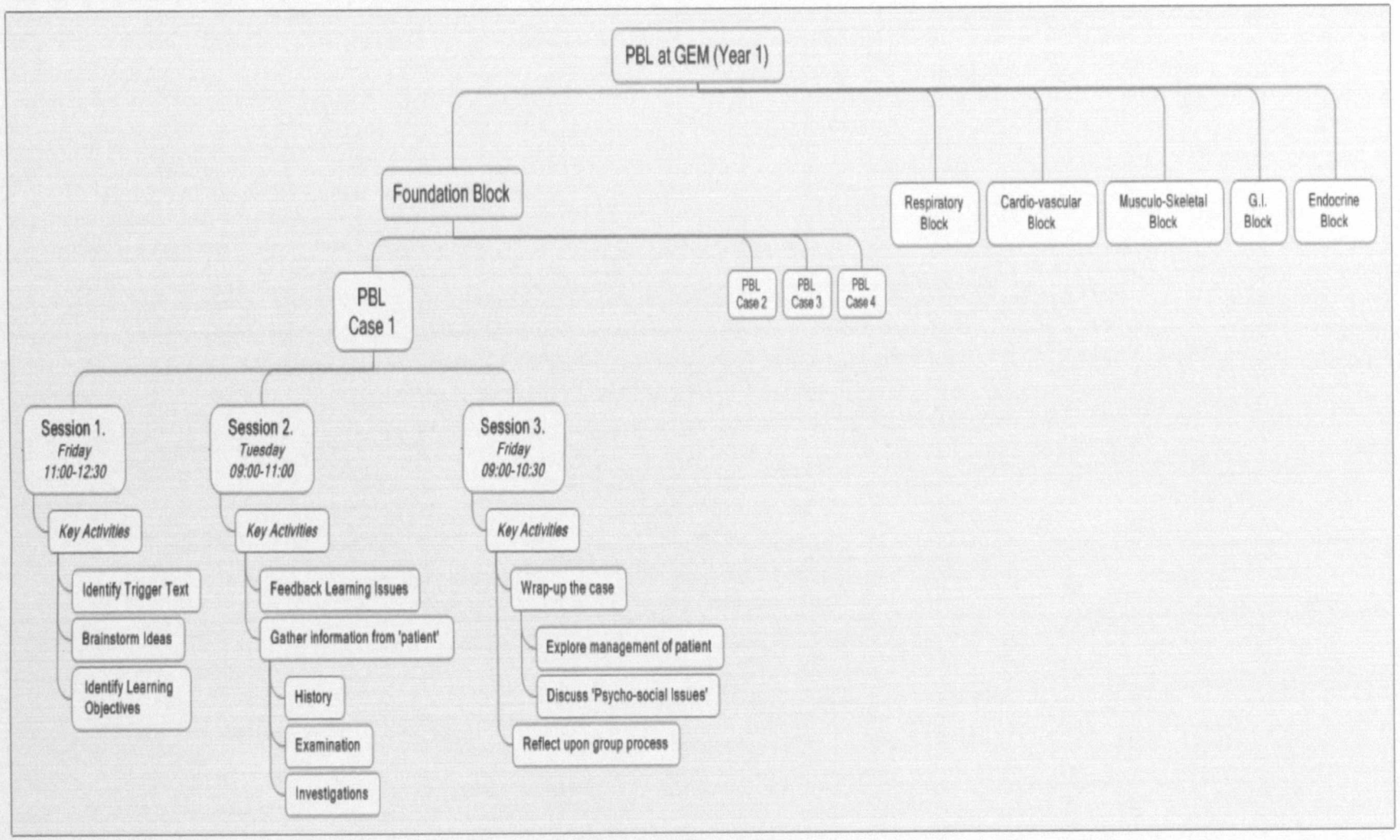
As the case concludes, the facilitator may share information from the written facilitator guide that has not been discussed by the students during the PBL sessions. This may serve as a safety net to ensure that students are aware of the intended learning objectives assigned to each PBL case. Different facilitators may adopt different approaches to sharing

this information with groups[14].

The formal structure of PBL at GEM is illustrated in Figure 4.3. This structure is presented to the students and facilitators at the beginning of the course. While a structure for conducting PBL is provided, the approach is not always rigidly adhered to at GEM, unlike other PBL programmes that follow a clearly defined model such as the '7 Jump model of PBL' at University of Maastricht in the Netherlands (Schmidt, 1983).

[14] See Section 6.3

Figure 4.3 Formal PBL Structure at GEM during Year 1



4.5 The People at GEM

4.5.1 The Students

Gaining entry onto the GEM course involves a lengthy application process. The criteria for admission to the course include a Bachelor's Degree in any subject with a minimum 2:2, or a Masters or a Doctorate degree. The level of previous academic performance needed for students to apply to GEM is lower than that needed at other medical schools (Howe et al., 2004). The decision to consider students with a 2:2 was an effort to widen access to medical training (Prideaux et al., 2000) (Section 1.4.2). The Graduate Australian Medical School Admissions Test (GAMSAT) is also used to measure candidate's predicted academic ability. Each year the cut off score for the GAMSAT is determined. Approximately 300 students with GAMSAT scores equalling or exceeding this score are invited for a 40 minute structured interview. Other factors such as relevant work or voluntary experience related to health care and health and criminal records checks are considered by the admissions panel prior to making formal offers. Each year ninety-one students are admitted to the GEM programme. The ages range from early twenties to late-forties.

Each intake of students is divided into 13 PBL groups. The standard size of each PBL group is seven students, but occasionally varies between six to eight students. The students work together in the same group for three PBL blocks, a time period of three to four months. They are then mixed up into different groups. Over the eighteen-month course students are allocated to three different PBL groups in succession.

Staff members who oversee the PBL programme at GEM allocated students to PBL groups in order to achieve a mixture of genders and students from both 'science' and 'non-science' backgrounds that refer to the general topic the students studied in their previous degree prior to GEM. 'Scientists' are graduates within biomedical sciences, sports science, biochemistry or pharmacy, for example. The students within this group have studied 'science.' The 'non-scientists' are those graduates with degrees related to the arts, social sciences and business. 'Non-Scientists' may have studied English, Latin, Sociology, Accounting, Finance languages, or computer science, for example.

4.5.2 Facilitators

The identity of facilitators is explored in depth in Chapter 6. Here I give a brief overview of who they are. For each block, a new group of educators come together to facilitate PBL at GEM. While some work primarily outside GEM, either in the university or the health service, the majority work within the school.

Some facilitators have medical and surgical training. They may be currently working (or recently retired) within the university and/or primary or secondary care or non-practising. Medical training, however, is not a pre-requisite to facilitating PBL at GEM. In fact the majority of facilitators at GEM are not medically trained. These non-medically trained facilitators mainly come from two areas: academia or the allied health professions. Academics may have a background in one of the biomedical sciences or in education. Healthcare professionals are normally employed part-time to facilitate PBL and work in a variety of professions that include dietetics, nursing,

pharmacy and osteopathy.

One facilitator is allocated to each of the thirteen PBL groups. There are a number of roles expected of the facilitator outlined in the GEM Course Curriculum Specification document (2003a). These "official roles" include:

- To facilitate the formation of a PBL learning group
- To guide the PBL process in the group
- To manage the dynamics of the group
- To enable students to generate appropriate learning issues for themselves
- To facilitate the development of habits of life-long learning in the students
- To promote and support the personal and professional development of students
- To provide feedback to students on their performance and progress
- To participate in ongoing review and development of the PBL process

(GEM, 2003a, p.39)

4.5.2.1 Asynchronous Rotation of Facilitators and Students in PBL Groups

Facilitators change groups after each block (every 4-6 weeks). Students change groups after three blocks (every 12-18 weeks). I will explore the impact of this in more detail later within this section and also within Chapter 5. How the decisions were made to rotate the facilitators at the end of each block and to rotate the students after every three blocks is unclear. However, these decisions were being made while the school was being established and it is very likely that higher priority tasks like the construction of the building were demanding considerable attention.

Limited references to the rotation of facilitators and students are found within a document outlining the proposed educational policy and curriculum specification for the GEM programme. Within a section providing general descriptions that three PBL sessions will occur over two days the following reference is made:

> 'The subsequent new case will commence at the beginning of the week immediately on the completion of "step three", hence the requirement for a single facilitator to be with the group for the whole block.'
> (GEM, 2003a, p.39)

I interpret the point being made here that one block is the minimal amount of time a facilitator could work with a group. This is due to the scheduling of the new case to start immediately after the previous case.

Reference to changing the students is more open-ended, 'The student membership of the group will be unchanged for at least one whole block' (GEM, 2003a, p.39). More recently discussions among facilitators relating to the changing of facilitators after each block have pointed to the need to meet the necessary staffing levels. This involves using a range of facilitators who work both within GEM and also externally. Rotating facilitators after each block allows staff from other departments to facilitate one or two blocks of PBL:

> 'PBL facilitators will comprise a core group of permanent facilitators ... who combine healthcare experience and qualifications with a commitment to the PBL approach, and additional facilitators who will contribute to some, but not all modules. Additional facilitators will tutor a PBL group for an entire module to ensure consistency and the establishment of an effective relationship.'
> (GEM, 2003a, p.38)

This issue of asynchronous rotation is important as it highlights an interesting variable of PBL. As discussed within the literature review, the nature of PBL varies depending on its context. In some educational contexts, described in the literature, facilitators remain with a PBL group for an entire academic year. In others, the facilitators rotate around the groups each week. This timing variable is not discussed within the PBL literature even though it will impact upon the practice of facilitation. How can facilitators assume basic responsibilities like modelling, coaching and fading (Collins et al., 1989) if they only have limited time to spend within each PBL group?

I would suggest that this timing point about how often facilitators rotate through PBL groups represents a bigger issue, that is how seemingly insignificant issues relating to PBL impact upon the roles and responsibilities of facilitators within a specific educational context like GEM. Hot topics within the literature on PBL facilitation like content-expertise of facilitators have possibly overshadowed these more fundamental issues. Whereas the debate about content-expertise is complicated because of the unfeasibility of hiring only content-experts as facilitators, the issue of timing can be more easily addressed. I would argue that if facilitators are central to the PBL process (Barrows, 1988), time is needed for facilitators to model behaviours within PBL groups, coach students as they develop their skills and fade as the students function independently. If the core aims of PBL are to be achieved then attention needs to be paid to whether something relatively straightforward like whether the scheduling for rotating PBL facilitators around groups allows facilitators

to carry out their key roles and responsibilities[15].

4.5.2.2 Training Facilitators at GEM

All facilitators undergo a three-day training programme at GEM before starting to facilitate students. During the training emphasis is placed upon adopting a learner-centred approach, creating a learning climate, managing the group process and facilitating feedback. Part of the course involves the trainee facilitators assuming the role of students and studying a PBL case based upon a non-medical subject. For example during my training, the case related to a bushfire that occurred within South Africa. This training provides new facilitators with opportunities for experiential learning about PBL. Each participant also takes turns facilitating a group of student volunteers while being observed by other new facilitators.

Beyond the initial training, other resources are provided to support facilitators at GEM. These include facilitator training sessions, peer observations and a journal club. The latter, at the time of writing, have been disbanded although it was operational during the data collection period.

4.5.2.3 The Facilitator's Guide

Facilitators are given a guiding document for each PBL case that provides a range of information. This is a tool facilitators can refer to before and during PBL sessions. They are available to each facilitator for each PBL case. These documents contain information about the case including the trigger text. This can be used as a reference

[15] How asynchronous rotation impacts upon facilitation is explored in Section 4.7.4 and Section 6.5.

by the facilitator, but it can also provide a back-up trigger if students have difficulty accessing the trigger text on-line.

Facilitator guides also contain information for facilitators such as the *Key Emphasis*[16] for the case. This section broadly outlines the learning objectives for the PBL case as previously described (Section 4.4.1.1). They also sign-post learning topics. For example in PBL Case 6.2 these include body fluid distribution and balance, metabolism of potassium, acid and urea and ethical issues involved in obtaining informed consent to therapy from confused or unconscious patients (Tutor Guide 6.2, University Sydney, 2002, p.2).

Facilitator Guides also include sections entitled *Discussion Points*. These include questions that the facilitator may ask the group. Examples of these include 'What is light-headedness?', 'What role does the kidney play in maintaining circulating blood volume?', 'How do diuretics work?' (Tutor guide 6.1, University of Sydney pp.1-3).

A breakdown of the steps of the PBL process is also outlined in the guides along with guidance on how much time may be spent on these steps. Using the Facilitator Guide for Case 6.1 as an example, the steps for Session 1 include *Identifying Cues* (This step is allocated 20 minutes.), *Problem Formation* (10 minutes), *Hypothesis Generation and Organisation* (60 minutes). During this step students are encouraged to think broadly and systematically about the possible causes of the presentation in relation to *Basic Science Mechanisms* and *Epidemiological Evidence*. Additional

[16] The labels used within the Facilitator Guides are italicised within this section.

information is provided that highlights which learning topics the students might identify within each PBL session. A list of lectures that will be delivered during the week is also provided. This can help to inform the facilitator about which topics will be taught to students through lectures.

These Facilitator Guides provide extensive information to facilitators about the subject matter included within the PBL cases and also suggest questions to prompt students during the sessions. They also clearly map out the possible steps of the PBL process and the anticipated learning topics each case covers. The PBL sessions might mirror the steps outlined within the Facilitator Guide if the facilitators were leading these sessions and assuming the role of the teacher. However, these sessions are intended to be student-directed. Therefore, the structure does not necessarily follow the plan that is mapped out in the guide. As a result, when observing these sessions in practice, they appear to be more unpredictable. Rather than being able to anticipate what will happen, the facilitators react to what the students do on the given day[17]. Therefore, these guides may be thought of like Swiss army knives for facilitators. They contain various tools that facilitators may draw upon as PBL sessions unfold. However, the facilitator may choose to keep them shut and allow the students to develop or use their own tools. I explore this in more depth in the following two chapters where I present data showing a tension between student-directed learning and faculty-generated learning support and explore several ways in which the latter may hinder the former.

[17] See Section 5.4 for an example – PBL Group F, Session 2, 09:13

4.5.2.4 Case Briefing Meetings (CBM)

Another 'tool' (Spradley, 1980) or resource for facilitators, in addition to the facilitator guides are Case Briefing Meetings (CBM). These provide tutors with opportunities to regularly meet for one-hour each week. Everyone facilitating cases within the current block is expected to attend and the majority of facilitators do.

These meetings serve a number of purposes. They provide facilitators with opportunities to learn about topics contained within the next case. Normally a 'content expert' (e.g. a consultant physician) attends the meeting and serves as a resource to highlight important concepts students will cover within the upcoming case. They also answer questions raised by the facilitators (See Chapter 6). It resembles cascade-training (Wedell, 2005). This is an approach where an expert supports non-content experts as they learn about the case material. Using this approach at GEM is intended to ensure that facilitators have an 'adequate level of knowledge, understanding, awareness of the concepts/topics' (GEM, 2003b, p.5) in order to facilitate discussions in PBL. There are also opportunities for the facilitators to feedback on the progress of their groups during case briefing meetings.

4.6 The PBL Environment at GEM

4.6.1 New Building

The School of Graduate Entry Medicine and Health (GEM) is situated upon the University of Nottingham's satellite campus in Derby. It was designed and constructed specifically to accommodate PBL. The building includes twenty-six base

rooms where PBL sessions take place. It is situated behind a newly built 'Super Hospital,' the Royal Derbyshire Hospital.

Walking through the front entrance, visitors have shared mixed initial reactions to what they see. Some are impressed by the new environment, while another once commented, 'This feels like a prison!' In this case, the visitor was referring to the rows of PBL base rooms spanning across two levels, akin to prison cells.

While the space can feel deserted when students are not present; on a Tuesday or Friday when students attend PBL sessions, the environment is buzzing with activity.

4.6.2 PBL Base Rooms

Each PBL Base Room contains a round table and chairs around which the students and facilitator sit and discuss their work. A round table provides space for the group to congregate. Three or four whiteboards cover the walls and are regularly used during the group's discussion to serve as a space for recording brainstorms and communal mind maps along with diagrams that map out physiological mechanisms. These are basic whiteboards not electronic whiteboards. Students spend time during PBL copying diagrams and other information into their notes or exchange printed hand-outs containing the information presented. Any unrecorded information is lost when boards are cleaned prior to the start of each new case. Some groups take photographs of the whiteboards to capture their work.

Students customise the rooms with kettles and mugs for making drinks. Lockers are provided for students. These rooms are 'base rooms' for the students during three blocks. They provide a space for PBL but are also used by groups or individual students as workspaces during other times. For the most part, facilitators enter these rooms only during PBL sessions.

4.6.3 Objects

PBL rooms are full of 'objects' (Spradley, 1980). Some items are supplied by the university while others are brought by the students. As a result of this mixture, each PBL base room becomes a customised educational environment. This is illustrated within the following field note:

> *A circular table is at the centre of the room, piled with books, notepads, mugs and water bottles. At the far end of the room is a circular table around which sit six blue chairs. Four large whiteboards hang on the walls either side of the room and are covered with writing and diagrams. The wall at the far end of the room is glass floor to ceiling and bathes the room in sunlight. A board rubber is propping the window open. Two strands of yellow and red tinsel are draped across the top of the window. These Christmas decorations contrast with the spring sunshine and green leaves on the trees outside. One of the students is moving around the room cleaning the whiteboards but leaving some of the hand-drawn diagrams untouched. A female student is sitting and typing on one of the two computer terminals on opposite sides of the room.*
> (Field Note from Video Observation, PBL Group C, Session 1)

The university outfits each PBL room with two computer workstations. These are used to access the case materials on-line such as the trigger text and investigation results. Computers also provide instant access via the internet to Wikipedia a quick reference guide frequently used by students for sorting any unknown or unanswerable questions. Other on-line resources are also accessed. Sometimes the students use these computers for personal study outside the PBL session. Depending on the social relationships between students, sometimes students will go in to another group's PBL base room to work. However, a student would not enter another base room without having a social link with someone in that group. This demonstrates the personal nature of base rooms and how they map on to social relationships among the students.

Each room contains a mini-library of key textbooks, which get mixed with students' personal textbooks and books from the main library. They are normally scattered or stacked upon the various tables. Circular seating is preferred to squares as this arrangement is believed to facilitate eye contact among members and diminish the likelihood of students sitting back unnoticed. 'Being part of the group' is represented by sitting with the students and facilitator in a circle around the table. Strangers who visit to observe PBL sessions are frequently welcomed to join the group around the table. Students can access the rooms 24 hours per day for seven days a week. They can become a focal point of student activity within GEM. As one student described, 'This is our home-away-from-home.'

4.7 Initiation

4.7.1 Preparing Students for PBL: The 3 Legged Stool

During the first week at GEM, students attend an introductory lecture about PBL. During this lecture, broad themes are covered that relate PBL to good medical practice as outlined by the GMC: the importance of working in teams, learning via discussions and teaching each other and reflecting on their practice (1993; 2003). Students are also encouraged to have fun, ask questions and bring food. Students are introduced to a humanistic philosophy of medical practice using a 3 legged stool (Petty, 2004). Each year the lecturer introduces the students to a wooden stool he has carved and assembled for that cohort. Each leg represents the biomedical, the psychological and the social aspects to consider when practising medicine. The biomedical leg represents the knowledge of anatomy, physiology, pathology, pharmacology, microbiology, etc. The psychological leg recognises the patient's and the doctor's psychological states and their impact on treatment and management. The social leg recognises medicine as practiced within a social context. The seat of the stool is meant to represent how the patient constructs meaning.

4.7.2 The Process of 'Starting the Group'

Following this lecture, the students join their PBL groups. They spend two 90-minute sessions meeting the other students and their facilitators in their PBL group, and planning how they would like to approach PBL. These sessions involve doing introductory exercises and games, exploring learning styles and generally getting to know each other in preparation for starting the first PBL case. It is of note that a lot

of time is given to this first PBL meeting. In subsequent blocks when PBL groups reform (having been mixed up by faculty) or when a new facilitator joins the group only a few minutes are afforded to the task of starting the group.

There are a number of theoretical models relating to the processes of group development (Heron, 1999; Tuckman, 1965). The initial stage of 'forming' involves 'orientation, testing and dependence' (Tuckman, 1965, p.78). Within the literature on facilitating PBL groups, attending to the formation of groups is stressed (Azer, 2005; Barrows, 1988). Time dedicated to forming is agreed to enhance the group's performance going forward (Barrows, 1988, p.21). However, this stage is thought to be frequently overlooked as many groups are keen to begin the task at hand (Elwyn et al., 2001).

Educational researchers have paid little attention to observing how the process of forming PBL groups occurs in practice. If the formation process impacts how groups later perform, a point stressed within the group work literature, then exploring the process of forming groups is an important first step to researching what happens during PBL and what roles and responsibilities facilitators assume during PBL.

My initial intentions were to present the process of starting the group as background information to familiarise the reader with the educational culture at GEM. As I began analysing what I initially perceived as a straightforward process, I discovered the complexity involved in starting groups. This resonated with my own experiences as a facilitator. In looking at how group formation occurs at GEM, I will identify and

illustrate some of the challenges faced by facilitators inherent in what appears to be a simple process like starting a group.

I will begin by identifying how starting the group is emphasised as a key responsibility of facilitators during initial training. Next I will explore how starting the group occurs in practice, based on the data I collected. I will then focus my attention on a number of complex contextual issues that complicate the process of starting the group and may impact on how groups later perform.

4.7.2.1 GEM's Emphasis on 'Starting the Group'

At GEM, forming the group (Tuckman, 1965) is referred to as 'starting the group' (GEM, 2003b). I will use these terms interchangeably. The guidelines explaining 'the how to do it' of group facilitation describe the process of starting the group:

> The facilitator's functions here are to enable participants to get to know each other and to establish an effective learning climate. This will include participants introducing themselves to each other, sharing their hopes and fears for their learning and establishing the group's working rules. By involving everyone at the outset, the tone will be set. The provision of food snacks by group members will greatly enhance the atmosphere in the group and provide additional nourishment to everyone. If you provide snacks at the beginning this can continue for all subsequent sessions. (GEM, 2003b, p.18)

This extract clearly identifies the facilitator's responsibilities at GEM when starting a PBL group. The first is to 'enable participants to get to know each other.' This occurs through introductions and the disclosure of personal information (i.e. 'hopes and fears'). The second is to 'establish an effective learning climate.' This responsibility is then discussed in terms of 'establishing the group's working rules, involving

everyone at the outset' and providing food to nourish the group.

The process of starting the group occurs at the beginning of each new block. However, the process of starting a group during Block 1 differs considerably from the process in subsequent blocks. Therefore, I will first describe findings relating to starting a group in Block 1. I will then present findings on how the process occurs during later blocks.

4.7.2.2 Starting a PBL Group at GEM – Block 1 Year 1

Facilitators are given clear instructions at the beginning of the academic year on starting new groups. The following email extract was sent to facilitators at the start of Block 1:

Figure 4.4 Email

1.	From:
2.	To: GEM Block 1, Year 1 Facilitators
3.	Subject: Monday 20th start up of PBL groups yr 1; introductory exercises [sic]
4.	Hi Folks,
5.	1. In preparation for the very first session on Monday morning with the brand
6.	new year 1 groups at 11:00 I attach a document to use as a worksheet for the
7.	introductory exercise. I suggest we all do much the same for day 1, which is to
8.	do this as a pairs exercise = 2 students talk to each other for about 15-20
9.	minutes then all return to large group to 'report back' on the other person.
10.	This means you will pair up with a student too! This session is one hour only so it's only
11.	"hello" (group rules will come on Friday!)...
12.	4. Friday session has 2 parts to it; first part = group rules, "an intro to how to
13.	do PBL" and connecting with each other again to create the learning climate.
14.	2nd part = session 1 of the case. I attach the "one side A4 intro to PBL on GEM " too
15.	See you all on Monday at the introductory welcome lecture perhaps?
16.	Regards

As discussed previously, the process of starting the group involves two key responsibilities: *enabling participants to get to know each other* and *establishing an effective learning climate*. While these responsibilities are interlinked, they occur during two separate meetings at the beginning of Year 1 (Lines 6 & 14). I will present findings separately in order to examine each step in detail.

Within Figure 4.4 the facilitators are encouraged to dedicate all of their first session to introductions (Lines 6-11). Dedicating one hour to saying 'hello' (Line 11) illustrates the emphasis placed on forming the group at GEM.

However, the first session involves more than merely greeting one another. The introductory exercise (Lines 7-10) involves 'sharing hopes and fears' as well. A copy of the introductory exercise worksheet is provided in Figure 4.5.

Figure 4.5 Introductory Exercise for Session 1, Year 1 at GEM

INTRODUCTIONS ON GEM

In order to get to know each other better, use the following questions as a guide. You will then introduce your partner to the whole group later on, so clarify what bits are for public information and what is to be kept confidential between the two of you.

PERSONAL DETAILS

Share details such as name, origins, past jobs and studies & where you live

WHERE AND WHEN?

Describe a time and a place that holds a special memory for you and why

WHAT AND HOW?

Discuss something which you really enjoy doing. Give some details of the activity

WHY?

Describe an educational activity that is important for you, and why this is so. What has attracted you to become a doctor and to the GEM course?

SS.logical levels intro
(pp Robert Dilts)

(Field Note, September 2003)

This exercise involves both introductions and disclosure of personal information and 'hopes and fears' between students and among the group members. I have used it many times at GEM and have repeatedly observed the atmosphere within groups transform from feeling tense and nervous to buzzing with conversation.

My experience of facilitating this first session and talking to other facilitators about their experiences is that the session is well structured and facilitators feel confident guiding the group through the exercise. At GEM, facilitators have taken part in this exercise during their training programme. In terms of Cognitive Apprenticeship

Theory (Collins et al., 1989), the use of this exercise during facilitator training by course leaders is done to model the use of the exercise for new facilitators[18]. The facilitators then have an opportunity to use this icebreaker when facilitating a group of students later during the training programme. These opportunities along with the encouragement to implement the exercise at the start of Year 1 demonstrate how facilitators are supported or coached in using this activity. As a result, facilitators use the exercise within the group independently.

While the activity is intended to enable students 'to get to know each other better' (Figure 4.5) leading this exercise is very different from facilitating a group. The facilitator leads the introductory exercise. There is certainty about what the facilitator and students are doing. When facilitating other aspects of the PBL process, the outcomes are much less certain. These uncertain outcomes can arise as early as the second meeting. We can see examples of this presented within the next section.

4.7.3 Establishing an Effective Learning Climate

The second responsibility that facilitators have when starting the group at GEM is to establish an effective learning climate. While taking part in the introductions exercise described in the previous section will help to establish the learning climate, 'establishing the group's working rules' (GEM, 2003b, p.18) plays a part in establishing the learning climate. Within this section, I focus on the process of 'establishing the group's working rules.'

[18] The term 'fractal' is used frequently at GEM. It is regularly described to facilitators as referring to smaller pieces resembling larger pieces, for example as seen in the branches of a cauliflower. Each extending branch resembles the branch to which it is connected.

4.7.3.1 Ground Rules

Establishing ground rules are a key component of starting a group (Azer, 2005; Barrows, 1988; Elwyn et al., 2001; Jaques, 2000). Ground rules are a tool by which the implicit norms governing day to day behaviours are made explicit (Jaques, 2000). GEM students come from a variety of backgrounds. As a result they may have different experiences and expectations of working within small groups. One student, who had graduated from university the year before enrolling at GEM, described her experience of working in a small group as stressful, 'The tutor ran the seminar as a question and answer session and I felt nervous about looking stupid in front of everyone so I'd try not to make eye contact.' (Field Note, 2005_09_20). While this student might adopt similar behaviours based on her previous experience of working within a small group, other students have described different experiences of working within small groups.

Another student who had worked as a business consultant prior to enrolling at GEM had years of experience working in small groups as part of his job, 'I chose GEM because I didn't want to spend all my time sat in a lecture theatre. I like working in a team.' (Field Note, 2005_09_20). This student brought leadership and facilitation skills to the group. However, he felt frustrated at times when the group did not use its time productively.

Facilitators and students may have different interpretations of the norms that govern PBL at GEM. Setting ground rules can assist the facilitator and the group to negotiate and agree upon acceptable and unacceptable behaviours (Jaques, 2000).

The literature provides clear guidance on the purpose of ground rules and the process of setting ground rules (Brookfield and Preskill, 1999; Elwyn et al., 2001; Jaques, 2000). Elwyn et al. discuss ground rules as forming part of the foundation of successful group process (2001). Ground rules serve a number of important purposes. These are outlined in Table 4.4.

Table 4.4 Purposes of Ground Rules

- Promote group norms that have the maximum likelihood of creating effective communication
- Allow group members to realise and enforce boundaries of their own behaviour and that of others
- Distinguishes irritations and destructive behaviour
- Ground rules appear to play a part in addressing 'the irritations that inevitably occur as the group develops [e.g. late arrival]' but could become 'destructive norms'
- Way of establishing expectations of individual interactive sessions

(Adapted from Elwyn, 2001, p.102)

Group members are central players when setting ground rules (Brookfield and Preskill, 1999). Rather than the facilitator setting the ground rules, students are encouraged to identify ground rules based upon their recollections of positive and negative experiences within groups. The tutor's role is to assist students in moving 'from general declarations ... specific behaviours' (Brookfield and Preskill, 1999, p.44)

Facilitators may suggest simple ground rules to model the process to the students. They may also coach the students to ensure that ground rules are 'clear, simple, and capable of being enforced' (Elwyn et al., 2001, p.103). After deciding ground rules, facilitators and groups are encouraged to revise them as necessary in order to

ensure they reflect the needs of the group (Elwyn et al., 2001). At GEM, facilitators are trained to set ground rules when forming the group. This process is also addressed within the GEM Facilitator Guidelines:

> Groups function best when there is a state of security and trust between members. The climate needs to be supportive and sufficiently challenging at the same time to stimulate and promote learning. This will involve the setting of **group rules** [emboldened in original text] for working. This will be a collaborative exercise in which, for instance, some of the following may be considered; [sic] confidentiality, respect for different opinions, opportunity for all to participate, one person talks at a time, time keeping and permission to get involved at a level that feels appropriate for each individual. One particularly effective group rule is to encourage everyone to make "I Statements" or to speak for themselves in all discussions. Other factors to consider will be rules about smoking, attendance and time keeping. A constructive learning climate requires individuals to express their expectations, hopes and fears early in the process. This will include clarifying everyone's roles, how the process will flow and the place and methods of assessment and evaluation. The climate needs to be established early on in the groups' [sic] life and attended to regularly in order to maintain a healthy environment. (2003b, 25)

This extract conveys clear messages about the use of group rules at GEM. Many of these suggestions resemble those made in the literature. Creating a learning climate involves the setting of group rules (Elwyn et al., 2001). The facilitator and students will collaborate when setting group rules (Brookfield and Preskill, 1999). When groups do set rules, they may write these on a whiteboard where they often remain in view of the group.

Much of the discussion in PBL literature about ground rules relates to setting them (Azer, 2005). Little attention is paid to whether or how they are used when small groups are working. By exploring how the process of setting ground rules occurs within groups, I began to observe complex issues arising for facilitators.

4.7.3.2 Students Choosing Not to Set Ground Rules

At the beginning of Block 1 in Year 1, groups have time dedicated to setting group rules. While setting group rules is encouraged, facilitators can face difficulties when attempting to establish the group's working rules. An issue that was highlighted from the research I undertook was PBL groups choosing not to set any group rules. These findings confirmed my own experience when facilitating my first PBL group. All of the students participated in the introductory exercise. When we moved on to discussing using ground rules, a student suggested not setting group rules, *'We're adults. We can manage ourselves.'*

This issue arose repeatedly during Case Briefing Meetings and also was mentioned during an interview I conducted with a facilitator at GEM who recalls their experience of working with a group that chose not to set ground rules:

> 'They didn't want to set any group rules and they would really just play it by ear really and just see how it went, . . . which . . . I think I felt I wanted to get a little bit more structure out of that session but again I didn't feel like I could impose, this is I think is one of the difficulties of facilitating PBL groups for me is that I know how I like to work and I have to try very hard not to try and make the groups work how I want to them work because that isn't what it's about, it about letting them work how they want to work provided it is achieving what they want to achieve.'
>
> (Fac. Q Interview 2005_04_08, 20)

The messages given to facilitators in the literature (Azer, 2005) and during the facilitator training at GEM are that setting ground rules is a key part of starting a group. A point stressed within the literature is that the students are to play a central role in this process of setting ground rules (Elwyn et al., 2001). However in practice, students may opt not to set ground rules. This can create tension for the facilitator

who having been trained to set ground rules encounters a group that chooses not to adopt them. The facilitator may feel that making the students set ground rules is teacher-led and conflicts with the students being self-directed (Wood, 2003).

However, this tension can also be interpreted using theoretical frameworks of facilitation (Barrows, 1988; Heron, 1999). The previous interview extract from Fac. Q illustrates how the facilitator is wrestling with different modes of facilitation. *'Making the group work how I want them to work'* could be viewed as a hierarchical approach to facilitating groups (Heron, 1999) or as modelling behaviours for the group (Barrows, 1988). Whereas, *'letting them work how they want to work'*, could be viewed as an autonomous mode of facilitation (Heron, 1999) or the facilitator 'fading' (Barrows, 1988). Interpreting the text in this way, then leads me to question whether the group possess the skills necessary to manage themselves. The hierarchical mode of facilitation and the role of modelling behaviours to the group can be seen as roles that the facilitator may adopt early within the life of a newly formed group. Alternatively, the autonomous mode or role of fading would be adopted after the group has developed the skills to function independently. In the scenario above, the facilitator may interpret the hierarchical mode or modelling as impositions. This may explain why the facilitator makes the decision to go with the group's decision not to set ground rules.

When facilitating a newly formed group within which the facilitator and the students are all new members, the facilitator may initially adopt a role that models the desired behaviours (Barrows, 1999). This may sound logical but in practice the

facilitator may feel uncomfortable going against the wishes of the group.

The scenario becomes more complicated within the context of Asynchronous Rotation when the facilitator enters a pre-existing group (See Section 4.5.2.1). Here the students have been working together for one or two blocks and the facilitator is the new member of the group. In this situation how does the facilitator decide what mode to adopt? Should they try to model, coach and fade (Barrows, 1988) or adopt hierarchical, cooperative and autonomous modes of facilitation (Heron, 1999)? Findings relating to this issue will be described and explored in more detail within the Section 4.7.4.1.

These sections have explored issues arising when starting newly formed groups during Block 1 at GEM. The emphasis on starting the group extends beyond Block 1 to the start of each new block. During subsequent blocks, the process of starting groups becomes more complicated. I will explore this issue in the following section.

4.7.4 Starting Pre-existing PBL Groups at GEM

The message of taking time to start the group is frequently reiterated throughout the year at the start of each new PBL block. However, during subsequent blocks, the process of starting the group changes significantly from that used during Block 1 in Year 1.

Initially, there is less time available to dedicate to starting the group after Block 1. During the first PBL block in Year 1, facilitators and students had two sessions, a total of 2.5 hours, dedicated to starting the group. During subsequent blocks 2 - 6, facilitators are encouraged to dedicate time to 'Starting the group.' However, this process is done during Session 1 of the new PBL case for the new block rather than having two sessions solely dedicated to starting the group. The process of starting the group occurs during the time normally dedicated to Session 1 of the PBL case.

Therefore the process of starting groups occurs more quickly in subsequent blocks. During one video-recording, the process of starting the group lasted approximately 7 minutes and 30 seconds. During another, it took approximately 15 minutes. Both observations were shorter than the 150 minutes allocated to starting newly formed groups during Block 1.

In later blocks, starting the group occurs after students have already had 1.5 to 2 hours of PBL session 3 on a Friday morning. During the first block of year 1, facilitators were introduced to a fresh group. In subsequent blocks, facilitators meet students after a morning of PBL at the end of the week at the end of a block.

4.7.4.1 'Treat the Group as a Brand New Group'

The following extract is taken from the first case briefing meeting in Block 6 (final Block of Year 1). Here the chair is reminding the facilitators to take time to 'Start the group':

> 'A general reminder ahead of the case discussion, um, just to invite all the facilitators to treat the group as a brand new group. You'll certainly be coming in new to them and it's an opportunity to just reestablish, you know, working procedures, um, perhaps a few introductions whose who, um, because in my experience I've found that even going round the groups asking them to share a little bit about themselves that no one else would know, quite a lot comes out. So just a little tip if you'd like, to treat them as a brand new group, spend a bit of time on group formation, group process, group rules an, and if you'd like to also clarify your role, that you're gonna nudge, confront, keep them on track, bring the food, no, or whatever,so just an opportunity to clarify your contract with the group as well, go for it, go for it as a brand new group.'
>
> (CBM 6_1, 00:07)

Here the repeated message to facilitators is to treat the group 'as a brand new group'. While these groups are referred to as 'new groups', this does not accurately describe the actual membership. The practice of asynchronous rotations means that the students have not changed groups. The students and facilitators both join new PBL groups during Blocks 1, 4 and 7. However, at the start of all the other blocks, the students remain together. The facilitator is the only new member in the group. This point raises a number of interesting issues.

To begin with, what impact does asynchronous rotation have upon the developmental stages of the group? According to Tuckman's stages of group development, groups go through a process of forming, storming, norming,

performing and adjourning (1965). Does replacing the facilitator after every block reset the development of the group and take the group process back to the forming stage? This interpretation may reflect the recommendations in the extract above to treat the group as a brand new group. However, this view is problematic.

The students have worked as a group for one or two blocks prior to the arrival of the new facilitator. During this time, the students will have progressed through stages of group formation (Tuckman, 1965). The group has a history of working together, which the facilitator has not shared. The group may have made decisions about how they work relating to adopting roles within the group or setting ground rules that the new facilitator will not have been present. These experiences are not erased when a new facilitator arrives. Therefore, the facilitator needs time to observe and to become familiar with the established norms within the group.

What I observed in my data and experienced in practice when a facilitator enters a pre-existing group, is the facilitator trying to become familiar with how the group has previously functioned:

> Facilitator B: Something I find useful when I start with a group is that if I don't get some idea sense of how you like to work, what you like to do, and why you put certain things on the board and where things are put on the board, it is difficult for me to see where things are going during the first week. Given that it's only a four week block that might put me at a disadvantage (pause) Does anybody anyone have a way of telling me what your average, general way of...
>
> (PBL Group B, Session 1, 10:07:58)

Even as the students update the facilitator about how they work, the facilitators frequently take time to observe what happens within the group:

> Facilitator A: Now in terms of how you play each case, umm, again, I'm happy to just, for this, probably, first case just to see how you go, unless I think you're totally floundering, but you know you're in May the 13th now. You've been doing this for several weeks, I'm sure that's not gonna be the case.
>
> So as I say what I'll do in the first case is just get a feel for how you like to do things. And then if, if there are any things that I spot that I think might be worth raising that might improve sessions, or I think you're doing really well, I'll flag up at the review unless, as I said, things don't go that smoothly. So I'm happy at this point to hand over to you to kinda work out the trigger text and then start firing off learning issues, etc. for the weekend, but I'm happy to be guided by you.
>
> (PBL Group A, Session 1, 10:18:48)

A point to make from this extract is that the facilitator verbalizes his assumption that the group will function well simply due to the length of time they have been working together. The fact that the students have nearly completed a year of PBL and have already worked together for two blocks may have shaped his view. According to Tuckman's model, the facilitator is assuming that the group is at the 'performing' stage (1965).

However, the responses previously provided by the students raise questions about this. The following examples from video observations collected as this pre-existing group of students introduced themselves to their new facilitator highlight the issues students raised about how they perceived themselves to have functioned during PBL:

SA4: Ahh, sometimes [PBL] can be quite good sometimes it can be not so good.

Fac. A: Okay

SA3: Ummm, I am [states name], um, I prefer being called [states name] to most other things

Group: (Laughter)

Fac. A: I won't ask what they are

SA3: ummm... I did a degree a long time ago in business studies. I worked in various walks of life and decided to leave my reasonably well paying job to come back and be poor for a long time, umm, I enjoy PBL, I think we . . . as [Student SA4] suggested we are very variable, some days we work very well together, I, oh, don't think we ever, we always work well together. I think we're kinda quiet a friendly group, I think there's quiet a good atmosphere in the group, but I sometimes I think we're a bit

SA2: Unproductive

Group: (Laughter)

SA3: Slack

Group: (Laughter)

SA3: Yes. We spend too much time being nice to each other and not enough time doing any work. So um, I think we have variable results.

(PBL Group A, Session 1, 10:09:45)

A few moments later another student reiterates this issue around the group's productivity and highlights an additional area for development:

SA6: Um, yeah, and I've, I enjoy PBL. I think it varies quite a lot how constructive we are between sessions. Ummm, But, yeah, I think it's an interesting way to learn.

Fac. A: Uh huh

SA6: And, I think yeah maybe if we yeah, had a bit more discipline we'd get a bit more done. (Laughs)

SA2: (Laughing) Disciplined? (Laughing)

SA6: Well not disciplined, but I couldn't think of the word. (Laughs and tilts head back)

SA1: Chh, chh, (making whipping gestures with her hands)

Fac. A: I'll bring in the whip.

SA6: But I think sometimes we tend to talk over each other a lot and people don't necessarily

SA4: What do you mean? (Interupts SA6)

SA6: Listen

Group: (Laughs)

SA6: Yeah, there's a problem sometimes that you don't feel people are always listening.

Fac. A: Ok

(PBL Group A, Session 1, 10:14:49)

While this student states she enjoys PBL, she also shares her concerns relating to a need for the group to be more disciplined and how this may limit the group's productivity. She also draws the facilitator's attention to difficulties relating to students interrupting each other during discussions.

Here the advice given to facilitators during the CBM 'to treat the group as a brand new group' becomes confusing. The students in this group share a history from their experiences of working together during the previous two blocks. From this they are able to highlight what they feel to be important issues to the facilitator about the group's strengths (e.g. 'there's quiet a good atmosphere in the group') balanced against areas they need to develop (e.g. 'We spend too much time being nice to each other and not enough time doing any work. So um, I think we have variable results.'; 'We tend to talk over each other a lot and people don't necessarily . . . listen').

What I found surprising while observing this video was that there was no mention of ground rules. After the students highlighted the challenges they were encountering could have been an opportune moment for the facilitator to raise the topic of ground rules. Had the group set group rules previously? If so, what were they? Were they being implemented? Or did the group lack ground rules? If that were the case, this could have been the moment when they identify some rules to address the concerns they raised. This highlights an important issue that even though ground rules are frequently discussed within the literature on group work, they may not be discussed or implemented within PBL even when the need for them becomes apparent.

However, neither the students nor the facilitator mentions ground rules? This is interesting especially when we look at the issues the students raised during the introductions.

This assumption is tested later during the session when the facilitator questions the group about the methods they are using to identify learning issues. It arises again when the facilitator shares experiences of facilitating this PBL group with colleagues during a CBM (Section 5.3).

This finding is significant. The limited PBL literature relating to this recommends that both the facilitator and the students change groups simultaneously (Barrows, 2000). No one has questioned how rotating facilitators through existing PBL groups may impact upon the role of the facilitator and the PBL process.

4.8 Conclusion

This chapter has aimed to provide detailed insight into the local context where I conducted my research. It then moved on to begin to explore some of the general issues relating to the practice of PBL and facilitation. The following two chapters continue to explore issues relating to PBL. However in the following chapters, the focus shifts to exploring specific themes arising from my research.

Chapter 5: Exploring Self-Directed Learning within PBL

5.1 Introduction

My research findings are explored over the following two chapters. Data has been analysed from videotaped PBL sessions and audio recordings from CBM and my experiences as a participant observer at GEM. This chapter explores themes relating to students' self-directed learning during PBL. It discusses how observations of PBL in practice within the hybrid PBL programme at GEM compare with descriptions in the literature about the aims of PBL. I specifically focus my attention on findings relating to the students' engagement with self-directed learning (SDL). Chapter 6 focuses on the experiences and practices of PBL facilitators within the GEM course; I reveal how facilitators are challenged by and adapt variably to the model of PBL practiced at GEM.

This chapter is divided into four sections each of which illuminates issues relating to self-directed learning. Section 5.2 examines a key component of the PBL process: students establishing learning issues at the start of a PBL case. Section 5.3 shows how the hybrid curriculum in which PBL is situated impacts and overshadows the students' opportunities for self-directed learning during PBL. It also explores the interplay between attending to learning issues and working through the clinical case. Section 5.4 examines how students' report back their learning issues during Session 2. This is deemed to be an integral aspect of PBL. Finally, in Section 5.5, I focus on assessment and how this can distract students from self-directed learning.

5.2. Establishing Learning Issues

> 'In order to go beyond what is already known and to create new knowledge for novel situations, [students] need to know what they need to learn about a particular situation... how to formulate questions to seek the specific information needed, and how the knowledge (new or old) can be applied in practice. Collectively, these abilities define what has been referred to as expertise in self-directed learning skills or metacognitive learning abilities.'
> (Hmelo and Lin, 2000, p. 227)

This quote encapsulates the perceived importance of a central component of PBL: self-directed learning (Barrows, 2000). The GEM Curriculum Specification stresses the importance of students developing skills in self-directed learning through engaging with the PBL process (2003a). The PBL process involves a series of steps to support this as described by Barrows (2000) and developed in other PBL curricula (Wilkerson and Gijselaers, 1996).

At GEM, after being presented with a trigger text, each group of students is expected to work together to interrogate the text, to share what they already know about a topic and to identify learning issues. The next step is for students to research the learning issues and discuss their findings as a group during the next PBL session. The following observations focus on students identifying learning issues and whether the practices are aligned with the aims of developing students' self-directed learning skills.

The following extract provides an example of when this process works well with the students:

This group of seven students (3 women and 4 men) has just listened to the trigger text and is raising questions and discussing what issues they need to explore.

SD6: How relevant is his bladder being empty because he's just been to the loo and then collapses for two days, he's not going to be . . .

This question sparks an exchange of ideas to which some of the students contribute:

SD2: Yeah

SD1: We don't know, He might...

SD5: We also don't know if he's been incontinent lying there all that time.

SD4: It would be good to look at just how much urine you do effectively produce.

SD2: Yes, how much urine you produce per day.

SD4: Because its, and you have like for constipation, for bowel movements, you have like normals as to whether your constipated or whether you're loose.

SD2: There is strict, yeah, there is very strict amounts of your oliguria or um, that they have to work out.

SD3: Diabetes is.

SD4: Yeah, so there'll be ranges, so that's a learning thing.

SD2: Range of normal urine

SD4: Yeah

Fac. D: So, I mean, you mentioned oliguria, is everybody happy by what that means?

SD3: What's that?

Fac. D: You, what did you say, (SD2)?

SD2: Oliguria, that's something's reduced; but then there's anuria where they're not producing any urine

SD3: Is oligo?

SD2: Olig

SD3: Uh, yeah

SD7: Because there is a certain amount that you have to produce to get rid of waste products

SD3: Yes

SD7: Otherwise they build up inside

SD4: (unclear) concentration

SD7: And cause confusion

SD6: That's why you can't drink seawater

SD1: That's why you can't drink what?

SD3and SD6: Seawater

SD4: What's it called? (Turning to SD2)

SD2: Oli – O-L-I-G-O-U-R

SD3: What does Olig come from?

SD7: Oligo, Its manic, isn't it doing it a lot?

SD4: It's, isn't it a few? Because if you get an oligarchy then it's oligarchs and stuff

SD2: (picks up a book)

SD3: What would be immediate management if you're admitted?

SD2: Oligo, sorry (looking up at SD3) Oliguria is urine output less than 400ml per day

The discussion continues with the students continuing to raise questions and share what they understand and offer different views. They continue to discuss 'oliguria' and move onto polyuria and raise questions about 'normo-uria'

(PBL Group D, Session 1, 10:31:33)

This extract illustrates the students engaging in the PBL process, asking questions about the material presented in the trigger text. The students think aloud as a group and move smoothly between asking questions and offering answers. Through their discussions, the students highlight gaps in their knowledge:

SD4: It would be good to look at just how much urine you do effectively produce.

SD2: Yes, how much urine you produce per day.

SD4: Yeah, so there'll be ranges, so that's a learning thing.

These are then identified as learning issues, or in this extract a 'learning thing', and written on a whiteboard.

This extract provides an example from PBL practice of how students engage in an aspect of self-directed learning, specifically identifying what they need to learn (Candy, 1991). Self-directed learning is a 'core educational objective' of PBL (Barrows, 1986). I observed students frequently identifying learning issues through similar group discussions during PBL Session 1.

In the following extract, students again generate their own list of learning issues from the trigger text.

After working together for approximately one hour and fifteen minutes during PBL Session 1, the students have finished compiling a list of 12 'learning issues.' The seven students and their facilitator are sitting around the table and discussing how to organize them.

(PBL Group A, Session 1, 11:14:42)

The students have identified the gaps in their knowledge (i.e. 'learning issues'). According to the description of the PBL process in the PBL Guidebook (GEM, 2003b) during the next phase of self-directed learning, students are expected to decide what learning issues to research. This is done in different ways among the groups. Some groups allocate one learning issue to one student. In other groups, students share the responsibility for researching the learning issues (GEM, 2003b).

However, I observed a different activity:

One of the students rolls his chair away from the table toward the computer. He turns back toward the group and asks:

SB5: Do you want me to see, um, (turns to look at the facilitator) we just have a look before we finish. We just check the learning topics online. (Looking around at the other students) Do you want me to see if we've missed any major ones?

SB2: Yeah

SB3: Ok, so, do we want to prioritise anything at all, or would we be happy to leave them as they are?

SB1: I'm quite happy with this. We've managed to reduce the number.

While this is being discussed, a student wheels his chair from the table to the computer. He looks at the screen, moves the mouse and sighs. The facilitator,

who was sitting next to the student, sits up in his chair. He grimaces as he watches the student who is still looking at the computer. The student interrupts the discussion:

SB5: Good news, people. We haven't missed anything.

SB3: Oh, Cool.

SB5: Do you want to know what they are? (Moving back to the computer) Oh, yeah, lectures, Week 28 is it? The (Unclear speech) learning topics we've got are:

- Normal/Abnormal Hydration
- Fluid Homeostasis and the kidney
- Principles of IV fluid & electrolyte replacement therapy
- Filtration and reabsorption in the kidney
- Consequences of hypokalaemia
- Diuretic complications and abuse
- Hyponatraemia

As he finishes reading, there is a brief silence, followed by

SB1: Hmmm

SB2: Hyponatraemia? Low sodium?

The student then reads a list of lectures for the week:

SB5: And so apart from the two lectures we've got today:

- Nephron transport
- Renal Sodium transport
- Renal concentrating mechanisms
- Metabolic acid base disturbances
- Diuretic agents

are the lectures for next week.

(PBL Group A, Session 1, 11:15:01)

Rather than deciding which learning issues to research, the students logged onto the computer to access a list of learning topics generated by the GEM educational

committee. The students then compared their list, which they compiled during PBL, with a list of faculty-generated learning topics that was accessible via the computer. Students used the faculty list to gauge whether they had successfully matched their learning issues to the faculty list: 'Good news people we haven't missed anything'.

Checking the computer for learning topics is a commonly observed practice within my data. Students checked learning topics at some stage either during or after PBL Session 1 within every group I recorded during this study. In my experience facilitating groups during this period, students in Years One and Two at GEM demonstrated similar behaviours.

This approach contrasts with guidance from Barrows who stresses that student should have access to the learning issues generated by academic staff:

> 'only after they have completed their work with the problem, including all self-directed study. It serves as a guide to the students in subsequent self-directed study and is not intended to be a prescription.' (2000, p.42)

While learning topics are an inherent part of PBL practice (Barrows, 2000), they are 'infrequently mentioned' by researchers (Lloyd-Jones et al., 1998, p.493).

The intended aim of learning topics is to provide students with answers to readily asked questions. A key point highlighted by Barrows is that students show initiative to approach a staff member about a question they seek to answer (2000). As students engage with a trigger text during PBL Session 1, they become aware of knowledge gaps. For example, students may not know why an individual suffering a

heart attack may report pain radiating down her left arm. Having identified this as a question, students may then seek answers to their question by contacting academic staff members via email or a face-to-face meeting. As other groups may also identify similar questions, the faculty members may find themselves repeatedly answering the same questions posed by students across a number of PBL groups. Similar questions may reoccur each year with each new cohort of students.

A learning topic can, therefore, act as a tool within the PBL programme that staff can utilize to efficiently provide responses to frequently asked questions repeatedly posed by a large number of students (Barrows, 2000). Used in this way, academic staff members can use learning topics efficiently to support students' self-directed learning.

While learning topics may support students' self-directed learning, the practice of accessing them can become problematic. Barrows identifies a process whereby students first identify their knowledge gap, then formulate their questions and finally contact faculty members to seek answers (2000). At GEM this practice has been modified. Sets of learning topics were inherited from the Sydney programme for each PBL case and these were released to students during PBL Session 1.

From an academic faculty member's perspective, this modified approach could be more time efficient. Releasing learning topics with the PBL case could remove the need for staff members to repeatedly respond to the same questions posed by students.

However, modifying the time learning topics are released may disrupt the PBL process during Session 1. From a student's perspective, using the learning topics as a tool to identify the intended learning associated with the PBL case may be an efficient way of learning. This would reduce the risk of dedicating time to exploring learning that is not relevant to the case. Students tend to view this as wasting time. In the data that follows, students can be observed accessing the learning topics in order to assist them to identify the intended learning for the PBL case.

As decisions about how and when to release learning topics were made at the beginning of the course before most of the staff had experienced PBL, I can understand the rationale for making these choices. It is likely that the importance of these issues would not have been foreseen amidst all of the preparation that was required to launch the programme.

However by observing and participating in PBL at GEM, the effects of making learning topics available to students at the start of the PBL become noticeable. By observing and participating in PBL, I have recognised how this seemingly minor modification to the process of releasing learning topics could be subsequently used by students in a way that undermines both the PBL process and its aim to develop students' skills of Self-Directed Learning[19].

My data demonstrates how the tools intended to support the students (e.g. list of

[19] Near the end of this section I provide data of facilitators questioning this practice.

learning topics generated by the academic staff) may hinder the development of their skills as self-directed learners. Interestingly, this approach undermines the students' autonomy in establishing their own learning needs and sets up an assumption that the faculty list is 'right' and that their list may be wrong or deficient in some way.

The following example from another PBL group again illustrates students checking their list against those accessible via the computer. However, in this instance the computers are 'down'. This has consequences for the students, as they don't think they'll be able to access the faculty generated learning topics:

> SF5: Is everyone happy with the learning topics that we've got and is everyone happy to go away and learn a bit about those for Tuesday without knowing, and reading what's on the web as well?
>
> SF4: Is [the computer] still properly dead do we think?
>
> *This student gets up and goes to the computer while the other students continue talking and stands in front of it for just over a minute occasionally typing.*
>
> SF4: The computer doesn't appear to be generating any learning topics at the moment.
>
> SF6: (Stands up and walks across the room to whiteboard)
>
> *A few seconds later the student becomes excited and exclaims:*
>
> SF4: Oooh, we've got some learning topics! Oh no, they won't work but we've got a list of titles! We've got a list of titles . . . It says they won't work, but we've got a list of titles.
>
> SF6: Ok, what are ours and what are theirs?
>
> (PBL Group F, Session 1, 11:16:15)

The students are very interested to know what topics the faculty[20] has assigned to the case. So much so that, rather than leave the room once they finish identifying their own learning objectives, all of these students stay in the room and wait while one of the students reattempts to access the list of topics provided on the computer.

> SF4: Oooh, we've got some learning topics! Oh, they may not work but we've got a list of titles! We've got a list of titles
>
> SF6: Ok, what are ours and what are theirs?
>
> SF4: Odema part 1 and part 2
>
> SF6: Oh my God, they've got 8 mechanisms! Ooh, nephrotic syndrome, anyway haematuria/proteinuria, it's kind of
>
> SF4: Does anyone mind if I write it up?
>
> SF6: Basically, the next three things we've kind of got.
>
> (PBL Group F, Session 1, 11:16:16)

In the extract student SF4 has cause to celebrate when a partial list of learning topics appears on the computer. This appears to be better than not having a list.

While some of the learning topics match those identified by the students, some learning issues appear that the students had not considered. In some cases this appears to be the first time students may have encountered some of these topics. This is demonstrated in the following extract. Once again, the students have accessed the assigned learning topics via the computer. Next they spend time comparing their learning issues with those on the computer. Interestingly, as the

[20] In my study I use the term 'faculty' to represent the academic staff members at GEM who are responsible for organizing the curriculum. This term is also widely referred to within the literature on PBL.

students begin looking at these learning topics, they can't even pronounce some of the terms:

The student moves to sit in front of the computer and begins typing on the computer to log onto the learning topics.

SD6: Okayyy. (A click can be heard as a window opens.) Pathophysiology of illigoruria

A brief moment of silence and then the students exclaim: 'Ohhhh' with students nodding their heads and leaning back in their chairs. A student points to the board while another laughs excitedly. They realise that the student's (SD6) mispronounced 'illigoruria' matches the term 'oliguria' which they have already identified as a learning issue on the board.

SD6: Yeah, one out of one! Urea synthesis and

Group: Oooohhh

SD3: Did we not do that?

The student continues reading through the list.

SD6: Acid base regulation.

SD3: Um

SD6: There are nine learning topics, acute tubular necrosis. (Pause) Ooh, I'm not sure how to pronounce this (Pause) rha, rhabdomyolysis?

(PBL Group D, Session 1, 11:21:30)

The faculty list is used as a safety net to reassure the students that they have covered everything the faculty expects. A new term, rhabdomyolysis, is introduced. Interestingly, there is no discussion to clarify or define this term or to check the students' prior knowledge regarding this learning topic. I would argue that by providing faculty determined learning topics, students can bypass developing key

skills in self-directed learning. For example, accepting 'Rhabdomyolysis' as a learning topic could shortcut elements of learning and understanding. The students would not have selected this term themselves as a learning issue since they do not even recognise it. This casts doubt on whether the students' learning is self-directed or simply the result of following the directions provided in the pre-defined list of topics assigned to the PBL case.

Lloyd-Jones et al. argue that using faculty learning objectives can hinder student's development as self-directed learners (1998). They suggest that the provision of 'fixed resources' like faculty generated learning topics:

> 'can clearly modify the student's researching and learning routine by encouraging the student to become dependent on these resources instead of seeing them as supplementary to the PBL tutorial process. Even though the problem is presented first, the tutorial learning agenda will be over-ridden by the resources the faculty provides.' (1998, p. 493)

The findings I have presented bring this claim to life by providing examples from PBL sessions. These observations begin to raise questions about whether the practice of PBL supports students to develop skills as self-directed learners. The above examples highlight situations when students are provided with clear directions from the faculty about what to study rather than to identify these themselves. Interestingly, the students choose to follow the faculty list rather than stick to the learning issues they generated themselves. Concerns raised by Barrows that students will treat the faculty-generated resources as the 'prescribed' learning appear to be happening here (2000, p.42).

During PBL Session 1, groups are allocated between 60 to 90 minutes to engage in the PBL process. The aim of this session is for students to engage with the trigger text, to discuss their current understanding around issues they have highlighted and then to identify questions for further study (GEM Curriculum Specification, 2003; GEM PBL Guidebook Year One 2003 -4). The aim is to replicate how learning occurs in the clinical context (Barrows, 1986). The clinical scenarios described in the trigger texts, during PBL Session 1, provide the stimulus for assessing current knowledge and exploring new knowledge. From my observations of PBL in practice, what becomes apparent is that the intended practices for PBL Session 1 become eroded in some groups by having the influence of the faculty generated learning topics.

While in the previous extracts, students have waited until the end of the PBL session and attempted to compile a list of their own learning issues, other groups access the faculty list earlier during the session. The following suggestion came 25 minutes after the students had accessed the trigger text and appeared to be struggling to generate a list of learning issues:

> SB3: I was just thinking maybe we should look at the learning objectives, the learning issues on-line to see which physiology bit we need to concentrate on this week, cause we're gonna split up kidney physiology into four weeks.
>
> (PBL Group A, Session 1, 10:45:08)

In this extract, the students can resolve difficulties they may have in identifying their own learning issues by accessing the list of learning topics predetermined by the faculty. Therefore, by accessing the list during the first PBL session, students can opt out of self-directed learning that may arise later in the case.

Here it is important to note that the responsibility of ensuring that students do not shortcut the PBL process by accessing the learning issues, lies to some extent with the facilitator as well as the students within the group. As students begin working in PBL, the facilitator may play an active role in modelling and coaching students to adopt the intended practices aligned with each PBL session. In my experience, I feel more able to influence and guide a group's behaviour earlier in the year (e.g. Block 1) when they are new to PBL. As students gain experience in using PBL and develop habits from their shared experience of working together for one or two blocks, they may resist changes that their new facilitator suggests.

I recorded the following challenging encounter in my field notes that illustrates this tension:

> Just finished a PBL session 1 (Case 7.2) with my new Year 2 group. I really struggled with their problem-solving approach in session 1. Basically, it consisted of listening to the trigger text, writing down the information on the board (e.g. seizure) and writing a list of learning topics about those words (e.g. what is a seizure? What is epilepsy?).
>
> I am very frustrated by this approach. For one reason it seems very simplistic. Another reason (more importantly) is that they aren't tapping into what they might already know about seizures or epilepsy. There is limited sharing of knowledge within the group. One of the students mentioned, "I don't know anything about seizures. In order to move forward, I need to know what a seizure is." I responded that there might be other students within the group who do know something about seizures and might have something to share with the group. For example two students both have a pharmacy background and mentioned the valproate might impact the neural tube development of the baby leading to its myelomeningocele. (This was passed over during the discussion and no further discussion took place). Two other students both had some knowledge about the biomedical pathway associated with seizures.

> One student responded by saying that it wouldn't be fair to other people to rely on them teaching those in the group who didn't know.
>
> When I heard that I felt uncomfortable and confused because I believe the point of working within a group is for students to share their knowledge about a topic. Rather than the students focusing on what 'I' know or don't know - the point of group work and PBL is to focus on what do 'we' know or don't know.
>
> (Field Note, 2006_09_19)

This field note illustrates how groups may resist engaging with steps of the PBL process (e.g. sharing pre-existing knowledge). It also highlights the tensions that arose soon after a new facilitator joined this pre-existing group. This issue was also highlighted in feedback from students from another group:

> Sometimes felt that he tried to enforce his method of PBL onto the group, especially given we had a well-balanced routine. However, having said that, his suggestions did improve the structure of the PBL sessions.
>
> Was good at making us think things through given previous knowledge, rather than just try to look things up. This reinforced previous knowledge and gave confidence to the group.
>
> (Field Note 2006_04_07)

This feedback given at the end of the block illuminates the disruption caused when I entered this pre-existing PBL group and initially upset the group's PBL 'routine.' It also highlights how the student became accustomed to my style of facilitation as the block progressed. So while the facilitators do share responsibility for guiding students during PBL, it is important to recognise that students may decide not to initially adhere to the suggested approach, but may adopt suggested changes over time as the facilitator spends time with the group.

Here I return to the topic of how students approach to setting learning objectives can impede their practice of self-directed learning. Facilitators play an important role in ensuring that students engage with this step of the PBL process. However, when I have challenged groups about their practice of accessing learning topics early in a PBL session, students have shared their desire to be sure that they are spending their independent study time learning information that aligns with the material intended to be covered during the PBL cases. They have voiced concerns that relying entirely on setting their own learning objectives poses a risk that they could spend time learning irrelevant information or information that is unlikely to appear on the examinations. Information that is not mapped onto a PBL case as a Learning Objective is not examinable. Therefore, students may feel they use their time more efficiently by focussing their attention on learning information that relates to the intending Learning Objectives assigned to the PBL cases. These observations support early work by Blumberg et al. found through interviewing academic staff that in programmes where learning objectives set by faculty members were accessible, students placed less emphasis on generating their own learning objectives (1990).

Not all students at GEM are drawn to the faculty objectives. Sometimes a student's proposal to check the learning topics during the session is rejected by other students as illustrated in the following example:

After working on a case for approximately 25 minutes the students feel that they need more information about their confused patient with a swollen leg who had spent a couple days lying on his bathroom floor.

SD5: Yeah, it's just difficult without knowing a bit more about it, I think, we've got ideas but

SD2: We might be able to explore it more once we've taken a history from him.

SD3: It's almost worth taking a history.

SD4: Yeah

While the students are discussing this, one student is looking at the whiteboard, tapping his finger on the area where they have recorded some learning issues. He turns toward the computer:

SD6: Can I look up the learning topics? Can I just (Turning toward the computer)

SD7. Um, no, can we hold it? (Other students: yeah, yeah) Hold fire on that. Um, I would suggest, what I'd quite like to do is, um, I wouldn't mind taking a history now. But, it, unless you are? (Looking at the facilitator) Unless you are dead against that? It, um

SD6: (Looking at SD4) you don't want to look at, up the learning topics?

SD4: No, cause I don't really know what's wrong with him.

SD6: (Moves his chair away from the computer and back to sitting around the table)

SD5: And we haven't even really talked about the kidney in relation to this, whether it's, but, cause it could've been the cause if he'd already had kidney problems.

(PBL Group D, Session 1, 10:49:21)

This extract illustrates the different emphases that students place on developing their self-directed learning skills to identify learning issues. One student is keen to gather further information about the patient via the history and examination. The other student is eager to access the topics provided by the faculty, therefore,

bypassing the need for the group to generate further learning issues. Another student is influenced by the curriculum timetable in looking at the case. It is a renal block; therefore, there is a perceived need 'to talk about the kidney in relation to this.'

Interestingly, the student who proposed checking the learning issues doesn't engage in the group's effort to obtain information from the history and examination. Rather he waits until this process is finished and then suggests accessing the topics online 30 minutes later:

> *The students are in the process of listing learning issues. One student is standing up and writing a list on the white board as other students make suggestions:*
>
> SD1: Do we need to look at the production of dilute and concentrated urine?
>
> SD2: What is the production of urine full stop?
>
> Fac. D: And why, what has resulted in him being oliguric at the moment? What is the mechanism of that? So (SD1), what was that again?
>
> SD1: Production of concentrated and dilute urine
>
> SD2: And also what are the consequences of this oliguria systemically
>
> SD3: Is it worth looking at prostate? I don't, we've probably go too much to look at prostate trouble as well already . . .
>
> SD7: Yeah, well, the cancer block . . .
>
> SD3: That will come out in the learning topics, if that's
>
> SD6: Should we look at those? Check up (unclear)
>
> SD2: Yeah, can do
>
> (SD6 goes directly to computer to access the learning issues)

SD1: You can't wait! (Students begin joking with him)

SD2: You can't wait!

Fac. D: He's been sitting there for half-an-hour!

SD1: Waiting for it!

(PBL Group D, PBL Session 1, 11:20:29)

The group has been engaging in some exploration of what they might need to learn for the case but, ultimately, default to using the on-line topics. When the on-line topics are not available during PBL, students may elect to check them later, 'I will definitely read the computer generated learning topics. I always do' (SF6, Session 1, 11:16:16). This comment highlights the students' reliance upon the faculty generated learning topics.

In some instances, rather than obtaining the list of topics from the computer, students may rely on asking the facilitator whether they have covered all of the learning issues relevant to the case as demonstrated in the following extracts:

The students have been working on the PBL case for one hour. One student drums a handful of pencils onto the table and then begins putting them into a pencil case and asks:

SE6: Shall we? Are we going to pack it in there? I think we're not going to get any further without looking at it or delving into the history?

SE1: We've some things to think about. I mean as well as the stuff up there we've got some investigations to think about

SE4: Yeah

Following this exchange, one of the students looks at the facilitator:

SE3: Have we missed anything at all? Is there any glaring omission?

Fac. E: No, no. I mean, as I said, just stay broad for the moment there's nothing

SE2: That's good to know.

Fac. E: As I said to you, in this case, there's quite a lot of clinical data that comes out of it.

SE3: That's quite useful.

(PBL Group E, Session 1, 12:00:39)

The students use the facilitator to support their decision-making. The facilitator has different options in how they could respond (Heron, 1999). Possible options I have used or have heard discussed when working as a facilitator at GEM includes:

- Ask the rest of the group if they think there are omissions
- Ask the students how they could review their learning and list of topics to check for omissions
- Ask what other resources are available to aid their decision-making around learning issues
- Remind the students that further learning areas may be highlighted in subsequent sessions at the case unfolds.
- Reassure the students that the list is intended to include learning issues that reflect gaps in the group's knowledge rather than reflect a pre-defined list of objectives.
- Tell them what items are listed on the faculty list of objectives that they have not included on their list.

The facilitator's response to these questions can be crucial to either support or hinder students gain skills in identifying learning issues and developing their SDL

skills (Blumberg, 2000; Zimmerman and Lebeau, 2000). Barrows again offers clear advice that: 'The tutor only shares the list with the group after they have finished with the [PBL case].' (2000, p.42).

An example from another group illustrates what happens in practice:

> SC5: (yawn) So we've covered everything we need to cover now then, [Facilitator]?
>
> Fac. C: You're getting there.
>
> SC5: We're getting there, hmmm
>
> Fac. C: Um
>
> SC5: More psycho-social?
>
> Fac. C: No psycho social, the issue on here, which sounds like you have done before was 'ethical issues with informed consent from confused patients' so, and
>
> SC6: So what are we missing then?
>
> Fac. C: Not so much that you've missed something, go back to the one (Student SC3) mentioned
>
> (PBL Group C, Session 1, 10:36:45)

The facilitator influences the students' generation of learning issues in two ways. Firstly, she steers them away from exploring psycho-social issues. Secondly, she specifically guides them to something a student has mentioned previously.

Facilitators have different opinions about how providing a list of learning topics to students at the end of PBL session one may impact upon the SDL. The following extract is from a discussion among the facilitators at the final CBM of the academic

year. They are discussing how the students use the list of learning topics:

Fac. G: When I felt [PBL] worked well is that they've actually chosen their sort of learning areas to go and then they've compared it to what's on [the list of learning topics] rather than look there first 'cos that's when I think they're stilted 'Yeah what are they?' And don't always choose their own and go off.

Fac. I: I've always thought, even from the beginning, I've always thought they've been inhibitory to the process. Even at the end of the training I didn't realise that they got [the list of learning topics] at the end of session one. I still think that's odd.

Chair 1: It is something that we've been doing this year.

Fac. I: I think it, that's really strange. Give it to them at the end of the case.

Fac. B: Do you mean the learning topics?

Numerous Responses: Yeah, Yeah

Fac. I: I think that

Fac. B: (Names Fac. I), they're going away on Friday morning, over the weekend. If we won't give them the learning topics until two in the afternoon, people won't have time to, you're expecting them to go away over the weekend, enjoy themselves but do some work and come to workshops on a Monday. They don't have time to fit in the reading of those learning topics and then expand upon it unless you give them right up front.

Fac. I: I think that that is secondary. If they have a list of their, em, own learning objectives they can go and they can do the research or whatever it is

Fac. B: Oh I agree with you.

Fac. I: From scratch

Fac. B: I agree with you. I don't think the groups look at those and transplant the learning topics list as learning objectives

Fac. A: That's all they're doing I think.

Fac. I: They then say 'I don't need to do any work on that. I've got three or four sheets on that. That's all they know on that learning topic.

> Fac. A: The Friday session is a bit of a, dare I say it, waste of time, the hypothesis forming. They just list, 'Oh, you know what we need to learn now because here are the learning topics.' So it's prosthetic.
>
> (CBM RV 6_4, 40:50)

Blumberg highlights an important point raised by Candy (1991) that:

> 'A self-directed learner should be able to define what needs to be learned. The process of defining and using student generated learning issues may be an essential element in the development of SDL skills.' (2000, p. 203)

Blumberg describes a continuum of faculty-centred to student-centred PBL programmes. Within this context, she contrasts the use of student generated learning issues and faculty generated objectives in motivating students to become self-directed learners. Interestingly, she notes that little research on SDL has been conducted in faculty-centred programmes. It is also of note that her findings come from interview studies. My findings are based on observational data. The extracts I presented illuminate tensions between faculty objectives and student-directed learning.

5.3 A Hybrid PBL Curriculum's Influence on Self-Directed Learning

This second section explores ways in which more conventional pedagogical elements from GEM's hybrid PBL curriculum (i.e. lectures and workshops) influence students' levels of engagement with the PBL process. Rather than using the taught components as resources to guide their self-directed study as intended within the clinical context (Barrows, 1986; GEM, 2003a, p.18), students may substitute self-directed learning with faculty generated teaching (Blumberg et al., 1990).

The following extracts are from case briefing meetings (CBM) where facilitators discuss contemporaneous PBL sessions:

> Fac. A: And, and very often those first ones (PBL Session 1), it was constantly, the irony was, it was 'we've got lectures on this. So we don't want to know about it today. We'll do that on Friday because we've got two renal lectures. Now is it a lecture course or is it a PBL course?'
>
> Others: Mmm hmmm, yeah
>
> Fac. A: And what is the relative role of those within the course? I'm not saying one's right and one's wrong and I'm not saying the group were right or the group were wrong if they wanted to wait for the lectures, fine.
>
> (CBM RV 6_4, 22:56)

This extract conveys the facilitator's confusion and uncertainty surrounding students' engagement with self-directed learning during PBL. The issue that arises here relates to students 'constantly' resorting to lectures to meet their learning needs rather than discussing what they already know about a topic. This omits the step of activating and discussing prior knowledge from the PBL process. Instead, the students resort to information provided in the lectures.

From the students' perspective, this approach of utilising lectures may be a more time efficient approach to learning. This resembles the previous observations that explored tensions arising from students accessing learning objectives set by staff members in place of generating their own as part of the PBL process. Here the practice of Self-Directed Learning can be downplayed as students instead rely on lectures to provide them with information.

The frequency of this practice appears to be problematic for the facilitator. Based on his experiences in this group, the students 'constantly' delay discussing what they may know about learning objectives until after their lectures. This highlights how identifying and sharing pre-existing knowledge, what is seen to be a central step in the PBL process, is undermined as the students rely instead on teaching.

This shows how the PBL process can gradually become eroded. Making faculty-learning objectives available to students can distract them from generating their own learning issues. Rather than discussing their pre-existing knowledge, students may postpone this until after attending lectures. This in turn raises questions for the facilitator about the fundamental nature of hybrid curriculum at GEM, 'is it a lecture course or is it a PBL course?' Judging from the hybrid label, it is composed of both taught components and PBL components. However, the question may indicate an imbalance where the taught components of the course may overshadow the aims of the PBL curriculum to develop students' skills in Self-Directed Learning.

This point arises again during the CBM but this time in relation to the taught workshops:

> Fac. G: I think there's a similar thing with that with the learning topics and the workshops. So today they'd raised something and they said they wanted to go away because they said, 'Actually, that's covered in the workshop.' And then somebody then said, "oh should be we just summarise it in a few minutes?' but then they didn't do it.
>
> (CBM RV 6_4, 23:23)

The students in this group reportedly substitute another aspect of the taught curriculum, the workshops, in place of discussing what they understand about learning topics. These extracts highlight ways in which students use the lectures and the workshops that are intended to support the students learning in ways that could be seen as substitutes to Self-Directed Learning. It is not the existence of these resources, but rather when they are made available to the student and how their use may overshadow aspects of the PBL process that is the issue.

Another faculty-generated resource, that steers students to the intended learning for the PBL cases, is the list entitled Information Resources. Each week, an extensive list of books, websites, and other electronic resources are collated for each PBL case by the Information Services team (Figure 5.1). These sheets are displayed on a stand within the library and can be collected by the students on the day the new PBL case starts.

Figure 5.1 GEM Library Resource Sheet

The University of Nottingham
Information Services

Case 7.06: Dizzy Turns

Information Resources

Medicine and Health Sciences Team

Classmarks

Physiology	QT4	Ethnicity and health	WA330
Human physiology	QT104	Fluid and electrolyte physiology	WD220
Biochemistry	QU4	Heart failure	WG370
Body fluids	QU105	Urology	WJ100
Metabolism	QU120	Kidney	WJ300
Diet and nutrition	QU145	Renal physiology	WJ301
Pharmacology	QV4	Diabetic nephropathy	WK835

Clinical Reference Resources

Find these titles located in the main sequence of books.

Brenner & Rector's the kidney. 8th ed. Edited by Barry M. Brenner ... [et al.]. Philadelphia : Saunders Elsevier, 2008. *Chapter 3, The renal circulations and glomerular ultrafiltration; Chapter 15, Disorders of potassium balance; Chapter 36, Diabetic nephropathy.* (WJ300 BRE)

Comprehensive clinical nephrology. 2nd ed. Edited by Richard J. Johnson ... [et al.]. Edinburgh : Mosby, 2003. *Section 4, Urinalysis; Chpater 6, Diabetic nephropathy; Chapter 9, Disorders of potassium metabolism.* (WJ300 COM)

Oxford textbook of endocrinology and diabetes. Edited by John A.H. Wass and Stephen M. Shalet. Oxford : Oxford University Press, 2002 *Chapter 12.10 Diabetic nephropathy.* (WK100 OXF)

Textbook of cardiovascular medicine. 3rd ed. Edited by Eric J. Topol ; associate editors, Robert M. Califf ... [et al.]. Philadelphia : Lippincott Williams & Wilkins, 2007. *Chapter 87, Chronic heart failure management.* (WG100 TEX)

eLibrary Gateway Resources

All of the following resources are available through the eLibrary Gateway. Select the Library tab in the Portal http://my.nottingham.ac.uk or go directly to http://www.nottingham.ac.uk/elibrarygateway

Encyclopedia of Life Sciences
http://www.els.net
>Medicine & Health Sciences >eBooks
See articles on Water and sodium regulation in health and disease, Excretion and fluid balance in vertebrates and Acid-Base balance disorders.

PathCAL
http://www.pathcal.ac.uk

Last review: October 11
Next review: October 12

Providing this list of recommended resources to students is done, in part, with the aim to guide them toward accessing higher quality evidence like the Encyclopaedia of Life Sciences over more conveniently accessible websites like Wikipedia. While the latter may be a familiar source of information for students, the reports made by facilitators of students in their PBL group accessing information from Wikipedia tend to be met with groans of despair during CBM's. This appears to stem from their view that it may provide unreliable evidence (Laurent and Vickers, 2009). The Information Resources are also highly favoured by those students who utilize them. These resources signpost students toward quality sources of information and remove the need to search for learning resources.

One concern about these resources is that students could become reliant on them. While locating and using quality sources of information is an important aim of higher education, providing this level of guidance to students throughout the PBL course could be seen to undermine the development an aspect of self-directed learning identified by Barrows:

> 'Physicians should be able to determine what available learning resource would be most effective and practical for their defined learning needs.' (2000, p.31)

The concern here does not relate to the existence of these resources but rather in the practice of providing the list of Information Resources to students during every PBL case throughout their course as is the practice at GEM. This practice resembles that reported by Blumberg et al. whereby the provision of faculty learning objectives undermined the practice of students generating their own learning objectives during

PBL (1990). As I observed some students collecting and using these resources each week, I began to question whether providing this resource each week undermines the need for students in this hybrid PBL curriculum to develop their skills to autonomously determine their own learning resources? According to Heron's Modes of Facilitation, providing these resources to students during the early phase of their course could serve to effectively model this skill to students (1999). However, over time, the provision of these could be limited or stopped in order to create opportunities for student to determine appropriate learning resources more autonomously (Heron, 1999).

The benefit of adopting this approach is that it may save students time in identifying their own resources. By using the sheet, students are directed to high-quality relevant tools to support their learning.

However, this approach may prevent students from gaining skills in learning to identify and evaluate the quality of resources themselves. Also, these sheets provide students with a sense of what faculty members or librarians expect students to study during each PBL case. They may, therefore, pull students away from pursuing their own identified knowledge gaps on a subject.

Scaffolding students learning is an important component of the PBL process. It would be unrealistic to isolate students from academic assistance within any form of PBL, whether 'Authentic' (Barrows, 2000, p.67) or hybrid. However, the issue of when these resources are made available to student requires consideration. This issue of

timing may influence how students use the resources. Instead of scaffolding students' self-directed learning, the resources could overshadow the PBL process. For example, if students can access the timetable and titles of lectures and workshops prior to the first session of a PBL case and read HIV, Anti-retroviral Medications, and Addressing Risk-taking Behaviours, they will arrive to Session 1 with a clear idea of the intended learning objectives for that PBL case before they encounter the trigger text. This can undermine aspects of the PBL process.

For example from the facilitator's perspective, I have felt frustrated when students go through the motions of PBL like engaging with the trigger text but doing so with the background knowledge provided by the lecture timetable. This becomes apparent when students are asked to clarify their reasoning, 'What makes you think this patient could have an HIV infection?' and they respond, 'Because we have a lecture on it this week.'

This contrasts with the following scenarios presented by Hmelo and Lin that are used to clarify why healthcare professionals need skills associated with Self-Directed Learning:

> A patient presents in the emergency room with an unusual set of signs and symptoms. A new piece of life support equipment is in the intensive care unit but none of the night shift personnel know how to use it to aid a critically ill patient. An elderly patient in a nursing home develops an infection that is resistant to all of the usual broad-spectrum antibiotics. In all of these situations, competent physicians need to know how to go beyond what they already know to deal with new problems successfully. In order to go beyond what is known and to create new knowledge for novel situations, they need to know what they need to learn about a particular situation, what particular medical procedures and resources are appropriate for the situation, how to formulate questions to seek the specific information needed, and how the knowledge (new or old) can be applied in practice. (2000, p.227)

Within these scenarios the physicians do not have the answers to their questions before they encounter problems. They need skills to 'go beyond what they already know to deal with new problems successfully.' Providing students with access to what they need to know (e.g. lecture timetables) before they encounter the trigger text undermines the development of their self-directed learning skills and may not adequately prepare them for the realities of clinical practice outlined above.

Interestingly when the students didn't have taught components within the timetable directly relating to issues within the PBL case, the facilitator perceived the session to go well:

> Fac. A: I mean today's session went wonderfully, and I expect it is because they don't have many [taught] sessions on prostates, etc. And the only area where they then touched on, I can't remember what it was, but they said, 'Oh, well we can leave that because we're going to have a lecture this afternoon.'
>
> Others: Mmm hmm
>
> Fac. B: My group also said something like that
>
> Fac. L: Yeah, mine too
>
> (CBM RV 6_4, 24:14)

In some groups, after initially engaging with the trigger text, students may decide to disregard the clinical case and instead focus solely on learning the basic sciences:

> Fac. H: 'Can I ask a process question? The group I've got seem very reluctant to consider anything about the [clinical] case at all other than the mmm the initial history [trigger text] that sets it off. They're entirely (pause) sorry I don't mean what I've said. What I meant is that they're reluctant to relate anything to the case too much. They are more interested in understanding how the kidney works or doesn't work and the pathology and pathophysiology than they are about trying to put it into this history. And I've said it to them during the last case and I've said it to them this morning and they said that's the way we like to do it and I said well have you had, what did your other facilitators think? They said, oh yeah one, we discussed it with our last facilitator who decided we did it best this way.
>
> (CBM 6_3 RV 6_2, 5:42)

Another facilitator also recognises this issue:

> Fac. G: I think what you're saying is a good point. Because a couple of groups I have gone in, they say, 'We like focussing on science and not really do the case [further group discussion] They see it [PBL] as working through a case and learning the science; sometimes, I get the impression, as two separate things.
>
> (CBM 6_3 RV 6_2, 10:07)

Interestingly, the case author who is a content-expert (i.e. hospital physician) attending the meeting to brief the case, voices his concern over the students' choice to extract and isolate the science from the clinical case:

> Oh just in a sense I'm surprised that they, some of them have opted to do that because the whole attraction of this process is that they're integrating the two and the science becomes a lot more interesting if you can see how it operates in, um, the real world pathophysiology. So, uh, I think, if they've opted to do that, they are really cheating themselves.
>
> (CBM 6_3 RV 6_2, 11:30)

So far the extracts show students seeming to make the choice to disregard the case. However, they may be influenced or encouraged to do this by other academic staff involved in taught components of the course:

> Chair 2 (one of the basic science lecturers on the course): I did say to them that it is critical that they understand renal physiology early on because if they don't understand it in the first case they won't understand the rest.
>
> (CBM 6_3 RV 6_2, 8:16)

However, not all groups disregard the case:

> Fac. G: But I think then when they have tried to explain the case after they've done that they have actually found that quite useful 'cos it actually contextualises their knowledge and actually checks their understanding.
>
> (CBM 6_3 RV 6_2, 10:15)

Other facilitators also identify students focusing their time and attention on a specific learning topic divorced from the patient case. However, this behaviour shifts during different PBL cases and sometimes students do return to the clinical story:

> Fac. E: In the first case they spent a lot, because they were coming to terms with the kidney for the first time they spent a lot of time really wanting to bottom out how the kidney worked and neglected the case to a certain extent. In comparison to other cases I've done with students I really felt that they really wanted to spend a lot of time, they felt this is where they've got to understand the kidney and they were really going for that. But that was in the first case. I think in the second case I think they are more balanced actually between fundamental, you know, medical biological stuff and the actual clinic case.
>
> (CBM 6_3 RV 6_2, 7:22)

Of note, it appears to be the students taking responsibility for their learning and perceived knowledge gap (Renal Physiology). They choose to spend more time on this subject. Ultimately, it may prove more beneficial for the students to concentrate on a difficult topic rather than move onto considering the clinical case more broadly. This is an example of the students acting autonomously to meet their perceived learning need (Heron, 1999).

In another example:

> Fac. B: I mean, certainly with the group that I'm with, during the first week we didn't get to any of the patient, I don't think, we didn't get to the history or any tests or the investigations they might do until last Friday. But they made a, they said, we'll make a very conscious decision this week to do that and of course this week it was the other way around they were looking at taking a look if the local doctor's come out presumably we'll have a history there. So they went and got some history and did some examination and then tried to link that into what they would expect from their scientific knowledge that they've gain during the last week or so. So I think it just changes from one week to the next. I think it may just be a function from that first week [Directed to Fac. H] being the first week of renal and quite scary with the renal physiology
>
> (CBM 6_3 RV 6_2, 11:55)

Within the process of PBL, the trigger text is used to simulate a real-life clinical problem. The students need to identify their knowledge gaps, undertake learning and apply their developing knowledge to the clinical scenario in order to diagnose and manage the patient's problem. There will be times (as in real-life clinical problems) when certain learning needs take priority over others. Students may need to dedicate time to these before 'solving' the case.

Some groups may fluctuate in this behaviour. However in other groups, ignoring the clinical case may be ingrained within the group's culture. A facilitator comments on a group he inherited:

> Fac. H: (Name of facilitator) had exactly the same issue with them during the last set [the students ignored the case].
>
> (CBM 6_3 RV 6_2, 12:44)

The potential danger of this is that students attend to learning issues divorced from real life problems. They may miss opportunities to apply new knowledge to clinical problems: the diagnostic skills they will require as doctors (Barrows, 2000)

5.4 Allocating and Feeding Back Learning Issues

So far I have focused on aspects relating to how students generate learning issues. There are other steps of the PBL process at GEM related to learning issues (2003b). The practice of allocating learning issues involves different steps such as discriminating between which learning issues to cover; assigning these within the group; and, choosing suitable resources for researching these issues. Collectively these are deemed within the literature to be important components that reflect students' SDL skills in PBL (Barrows, 2000; Blumberg, 2000). Some schools assess students on their ability to effectively engage in these processes (Blumberg, 2000), although this does not occur at GEM. During Session 1 the group decides how the group will manage the list of learning issues. Decisions relate to whether the students will explore each of the issues or, alternatively, whether individual students will be assigned specific learning issues? Upon returning to the next PBL Session 2 or

3 of a case, students dedicate time to process referred to as 'feeding back learning issues'. If individuals within the group are assigned specific learning issues, they take responsibility for researching these and feeding them back to the group. An alternative approach is that all of the students look at every learning issue. They return to the next session and discuss their findings. What I have frequently observed happening is that students may assign specific topics to each other or choose topics for themselves to research. They return to the group as the only member who has studied this topic. They may then take turns and teach each other rather than discuss their findings as a group. PBL Session 2 may become a series of mini-lectures as each student individually feeds back learning issues.

This is an interesting time to observe the PBL process. From the facilitator's perspective, this is a time of uncertainty. Have the students researched a topic and prepared feedback? If so, what approach will students use to present their learning issues to the group?

Students use various approaches to feedback learning issues as mentioned. One approach is for a student to provide a mini-lecture to the group. This could run for five minutes or for 30 minutes depending on the student, the topic, how many questions the other students ask and what else needs to be done during the session. The quality of these mini-lectures can vary.

I have provided a detailed description of the following extract. It illustrates an example of a student feeding back to the group using a mini-lecture style. I have

annotated the excerpt with emboldened comments to show my thoughts on this:

It is just before 9:00 am on Tuesday morning the start of PBL Session 2. Three students are in the room. One student is unpacking her bag. Two students are doing final preparations on their learning issues by looking through textbooks and also on-line. Three other students and the facilitator are entering the PBL room, making drinks and unpacking their bags. After ten minutes of this activity all six students are sitting around the table with the facilitator. There is not much conversation. Nor is there a sense of urgency or enthusiasm to start the session. On the whiteboard is a list of students with their previously allocated learning issues. This serves as a prompt to identify who will start the process of feeding back.

SC6: All right, (Names SC5) you're up

PJ: The student puts responsibility for sharing knowledge onto one member of the group, thus abdicating joint responsibility for group learning.

SC5 hesitates.

PJ: Why the reticence? The student lacks eagerness to share his learning with the group. Could the facilitator have responded to this reticence?

Another student points to him and says 'It's you'. SC5 casually gets up and turns to the whiteboard, then slowly walks around the room looking for a board rubber. After 30 seconds, he returns to the whiteboard looking for a space to clear. A student points to the middle saying, 'Why don't you use that space it is just the history from last week.' SC5 then erases a space in the middle of the board. He steps back and again hesitates (This takes him two minutes).

SC5: Um (pause, staring at the whiteboard) this didn't turn out to be as interesting as I thought it would be, mainly because its (unclear speech) . . . I feel like I'm teaching you all to suck eggs explaining what happens with dehydration because we already know it or we all seem to anyway (nervous laugh).

PJ: This seems to be an assumption that the students understand this topic. There is no checking to see whether this assumption is correct from either the student or the other group members.

SC6: It is difficult, I know what you mean when you think that everyone else knows, but go on.

PJ: This student provides some encouragement but no clarification about what the students already know.

SC5: Yeah. First of all, I couldn't find anything on this, but as you all know from the workshop, if we lose volume you may end up getting more viscous blood.

PJ: This is surprising that the student 'couldn't find anything' on the topic of dehydration. Where has he looked? Has he spent time preparing? Interestingly, neither the students nor the facilitator question this. A second issue arising is that the student mentions the workshop. This suggests a reliance on information coming from taught components of the course.

SC5 begins to talk about dehydration. He hesitates every few seconds and continually shifts his glance from the students seated around the table to his notebook. He stands next to the whiteboard but is not writing anything onto it, although he has spent a number of minutes searching for the board rubber and clearing a space to write.

SC5: Um, so 12% weight loss due to dehydration is considered severe . . . Um, how, um a way of describing dehydration.

The students and facilitator are seated quietly at the table. They don't appear to be giving SC5 their full attention. For example, a student reaches into his bag and pulls out an apple. Another student sits with her arms folded staring ahead not looking at SC5. Another student glances out the window

After another three minutes of SC5 talking, he is saying:

In a lot of disease states, like heart failure and um some forms of hypotension there's like a perceived drop in blood volume, if you get what I mean (Pause) Oh God, you all look, uh, so uninterested (Laughs)

Students: (Laughter)

Student: We're interested

SC6: Yeah we're interested

SC5: Yeah? Are you sure about that? (He does not sound convinced.)

He then goes back to talking about his topic. Of note, he appears uninterested and uncertain about what he saying. There is a lack of enthusiasm and energy within the room.

A student puts his head in his hands. SC5 looks at the group stops speaking and laughs.

SC6 speaks up: It's all right I was feigning (Boredom) but you missed it.

The group laughs. This lightens the atmosphere.

SC5 groans and before he starts speaking, a question is raised.

SC3: Is this exactly the same as mine really? (Referring to the learning issue)

SC6: What's yours?

SC3: Hypovolaemia, I'm not asking

SC6: it's very similar

SC3: I'm not asking because I care that he's doing it. I'm asking because I want to know if hypovolaemia and dehydration actually exert the same effects, because, um they seem to

SC5: Uh, yeah well I suppose the ultimate effect of dehydration is hypovolaemia. That's the thing that kicks the whole body off . . .

At this point the atmosphere changes a little. SC5 speaks with fewer hesitations and more articulate as he describes the relationship between dehydration and hypovolaemia and responds to further questions raised by SC3.

However, this interchange does not have much effect on raising the energy among the other group members. They continue to sit around the table in silence.

(PBL Group C, Session 2A, 09:09:35)

Other students within the group adopt a similar didactic style of delivering a mini-lecture. Following the installation of PowerPoint projectors in the PBL base rooms (See Section 4.6.2), students from both year groups began routinely feeding-back learning issues using a lecture-style approach. In response to this, facilitators are encouraged to adopt a hierarchical approach (Heron, 1999) and dissuade students from adopting this practice but rather to encourage students to use the projectors to work collaboratively, for example, to project the trigger text, to review laboratory results and to view videos and web pages.

This is an approach I have frequently observed across groups in the video data and also from my own experience of facilitating. The example highlights a number of ways that the process of feeding back learning issues may deviate from the intended aims of PBL.

During discussions in CBM's, facilitators have likened their experiences of working with students in these situations as 'wading through treacle' (Field Note, 2005_08_04; See also CBM 6_4 RV 6_3, 17:16 near the end of this section). In this extract SC5's hesitancy and the group's apparent lack of engagement make the pace feel very slow. Here, what is absent is of significance. Even as students start the session, there appears to be a lack of enthusiasm to get started and share

knowledge. The student is talking to the other students but not using any visual aids like a diagram to support their learning. Feeding back learning issues as a series of 'mini-lectures' does not establish links with the group's prior knowledge, nor does it promote discussion, critique or clarification of terms. There also is an omission of students demonstrating how this new knowledge links to the clinical case (Barrows, 1988). Barrows warns against this approach to feeding back:

> 'The tutor should make sure that the group's study does not degenerate into a "show and tell" at this point. The power of their new learning will be lost if they just sit there and, in essence, lecture to each other about what they have learned in their study.'(1988, p.39)

What I observed happening in these situations was students using traditional teaching approaches. One student becomes a teacher and instructs the other students. In the previous extract, the students appeared to be so disengaged that the student, who was lecturing, commented, 'Oh God, you all look, uh, so uninterested.'

Another interesting observation is that the facilitator does not intervene in this observation and encourage these students to link information to the case or discuss their understanding of the information being shared. There are many possible explanations for this facilitator's inaction. The facilitator may lack the skills the necessary skills to address this behaviour. This is unlikely in this situation as this core facilitator is experienced and involved in facilitating PBL throughout the year. However, some individuals only facilitate one block of PBL case each year (See Section 6.2). In this case, the facilitator may be unsure how to respond in this

situation. This could also be a plausible explanation if this was the individual's first time facilitating PBL.

Conversely the facilitator may be adopting an autonomous mode of facilitation (Heron, 1999) whereby the students assume responsibility for identifying this behaviour as problematic and developing alternative approaches. By consciously deciding not to intervene, the facilitator provides students with an opportunity to manage the situation. The following field note is from my first year of working as a facilitator. This is the second session of a PBL case with a group of first year medical students. It describes a situation where I decided not to intervene even though I identified a difficulty a student encountered within the group:

> Continuing to struggle with PBL sessions. I suggested linking this session to the last one with a review from Friday. Team started with feedback from homework. Group doesn't seem to be a unit. Individuals interrupting regularly. Amy [21] did work on RA (Rheumatoid Arthritis) questioned/interrupted during feedback – she complained under her breath, I felt like I should intervene but also that she should address this vs. (versus) me sticking up/fighting her battles. Group was engaged and asking probing questions r/t (related to) RA – and covered lots of feedback informally under Amy's session linking in to other areas.
>
> (Field Note, 2003_12_03)

One of the issues arising in this field note relates to Amy, being repeatedly interrupted while feeding back a learning issue. If an outsider had been observing my behaviour as this was occurring during the session, I would have appeared to be inactive. However, I was deciding what to do as the situation unfolded. By not intervening in this instance, I am adopting an autonomous mode of facilitation

[21] This is a pseudonym.

(Heron, 1999). This provided Amy with an opportunity to address the issue within the group. Other facilitators may have responded differently to this situation. This is explored in more detail within Chapter 6.

Returning to the previous observation (PBL Group C, Session 2A, 09:09:35), the facilitator's decision not to intervene could be informed by an expectation that these students can function autonomously considering that this is the last block of PBL cases. This reflects an assumption that students possess the skills to function autonomously simply because they have worked together for an extended period of time and have an experience of PBL. This point was highlighted previously (See Section 4.7.4.1 Observation PBL Group B, Session 1, 10:07:58).

I have observed and experienced situations where the facilitator chooses to intervene in this situation adopting a hierarchical mode of facilitation (Heron, 1999). They may suggest an alternative approach whereby all of the students study all of the learning issues. This process of feeding back learning issues involves students sharing their learning about a topic. Through their discussions, students gain a deeper understanding of the learning issue (Biggs, 2003; Ramsden, 2003). This following observation reveals how one group adopts a discursive approach when feeding back learning issues:

Another group has just started PBL Session 2. The students have returned from a bank holiday weekend. Six students are seated around the table joined by their facilitator. They immediately begin reviewing what they had discussed during the previous PBL session. The atmosphere is full of energy and there is some banter and laughter about being filmed.

SF4: Shall we sum up, (SF2) what we did last time?

Some of the students update another group member (SF2) who was absent during Session 1 about details relating to the trigger text and learning issues that they identified. The students explore possible differential diagnoses for this patient. They compare this patient's presentation to previous PBL cases and discuss their current working diagnosis. The conversation then shifts to deciding what to do during this session.

SF6: Should we put up some ideas and then try to exclude them

SF1: Yeah

SF6: As we go along through the history and examination? (Pause) Maybe?

Fac. F: Are you going to talk about any of the learning topics? Or were you going to do those in passing as it were?

SF6: We always do those in passing actually.

SF4: Did anyone do any learning topics? (Laughing).

SF6: Well I looked into glomerular diseases . . .

(PBL Group F, Session 2, 09:13)

What happens next is that the students spend approximately fifteen minutes discussing nephrotic and nephritic syndromes, sharing their understanding of glomerular nephritis and exploring definitions of various terms (e.g. syndrome, uraemia).

This student then begins sharing what he read in two books as he sits at the table, leaning back in his chair. As he finishes another student begins sharing

what he read in a separate textbook. Another student then asks

SF6: . . . but nephrotic doesn't tell you anything about how it's caused.

SF5: That's not how I understood it.

SF6: Oh, really? Oh, bugger. (I thought I had it for a minute)

SF5: (But (pause) But) I did find a list of

SF6: (Right),

SF5: All the (different)

SF6: I, I thought nephrotic was a syndrome associated with a big loss of protein

SF5: Yeah.

SF6: Through the glomerulus. So it doesn't tell you how it's

SF5: No.

SF6: Right. And nephritis does tell you how it's done. It's immune mediated . . . that can cause nephritis. Do you know what I mean?

SF2: (looking at SF5) What was your understanding of that?

SF6: Yeah, have you got a (unclear speech) because that would be good

SF5: I understood the same as you except that . . .

As SF5 finishes her explanation, SF3 looks up from her textbook and asks:

SF3: Should I just bang these up on the board? It says that nephrotic is

(PBL Group F, Session 2A, 9:17)

The facilitator intervenes early in this session by asking how the group were planning to feedback their learning. There are some subtleties here that need to be highlighted before I share my analysis of this observation. The process of discussing learning issues relies upon the students sharing their work with the group. For this to

occur, students must have dedicated time to studying the learning issues that were highlighted during Session 1. As highlighted in Section 4.4.2, students normally begin Session 2 by feeding back learning issues before moving onto taking a history and examining the patient. If students have not prepared any learning objectives to feedback to the group or do not feel confident discussing them, they might seek to skip this step of the PBL process and move immediately onto the next step: taking a history and conducting an examination. This step requires little preparation as students gather information by posing questions to a patient role-played by the facilitator or another student.

I analyse the observation with this background information in mind. Also, to further set the scene, it is important to recognise the conditions within which the session was occurring. This is the students' first day back at GEM after a three-day weekend due to a Bank Holiday. This can present a challenge to the PBL process, as some of the students may have been away and possibly distracted from their coursework. This would result in some students being less prepared for the session. This point is highlighted within the CBM that occurs following this PBL session (See CBM 6_4 RV 6_3, 17:16 later in this section). Another contextual point is that one of the students was absent from the first PBL Session of this case. He is returning to Session 2 possibly not having seen the trigger text. Considering these two contextual issues, I am not surprised by Student SF6's suggestion, 'Should we put up some ideas and then try to exclude them . . . as we go along through the history and examination? (Pause) Maybe?' This suggestion would avoid the need for students to address the learning issues without having done any preparation. Student SF4's question

accompanied by laughter highlights this, 'Did anyone do any learning topics?'

This observation provides a contrast to previous extracts where I drew attention to facilitators not intervening during PBL Sessions. The intervention here is subtle but significant. Rather than remaining silent, the facilitator asks, 'Are you going to talk about any of the learning topics?' This draws the students' attention to this step in the PBL process and leads to a rich discussion. This may not have occurred had the facilitator not intervened [22] especially as one student suggested skipping the feedback and moving straight onto obtaining a history from the patient.

This discussion among the students captures what I regard as a highly significant moment in PBL at GEM. It offers a glimpse of what PBL might aspire to promote in students. These students are curious to clarify their understanding and engage in discussion. The students contribute by asking questions; sharing information they have previously read in textbooks; and debating which resources provide the correct answers. During the discussion, they recognise they have different interpretations of nephritic and nephrotic syndrome and encourage each other to share their understanding. They refer to textbooks in the room during the discussion. They all lean toward the centre of the table, actively listening to each other.

What the group is doing in this extract resembles descriptions of PBL provided in the literature (Barrows, 1986; Blumberg, 2000). Students review previous work, access prior knowledge, clarify terms, and then share and debate their understanding of

[22] I return to this point later in this section when the facilitator discusses her group during the CBM.

challenging concepts. They also use resources to aid their learning and comment on the quality of the resources. They work collaboratively toward a shared understanding and link their discussion to the clinical case. From my experiences as a facilitator, this is an example of PBL as it is meant to be practised. Unfortunately, I see more examples like that of the former extract where the process is laboured, the knowledge is patchy and there is a lack of collaborative learning.

Another less frequently utilized approach to feeding back learning issues but one that can effectively engage the students involves creative activities like quizzes, songs, cake models or designing new approaches to communicate topics.

One memorable example of students creating their own resources occurred when a second-year student presented a learning issue on anaemia. Some background information is necessary before I describe what she did. Throughout their 18 months at GEM, this topic, anaemia, was highlighted in a number of PBL cases. However, students frequently became confused and struggled to understand the different types of anaemia. Some voiced frustration that even though the topic frequently arose, formal teaching on this topic was limited as no lectures were provided (There was one scheduled near the end of the course). This in itself raises interesting questions about students' self-directed learning within PBL at GEM. They did not take the initiative to master this topic even though it frequently arose in cases. Rather, they expected to have a lecture. When the subject of anaemia arose again near the end of year two, one of the students in my PBL group volunteered to research it.

During the next PBL session, the student used the life of a red blood cell as a framework to explore and explain the different types of anaemia. She drew a large diagram on a whiteboard with the lifecycle of cell running along its top. She mapped out and explained how different types of anaemia related to different stages of growth of a red blood cell. The other students were impressed and listened attentively to her presentation. As she finished a student commented, 'This makes [anaemia] so clear now!'

Using a prompt I had utilized with students before to remind them to reference the resources they use (Barrows, 2000), I asked her where she had found this information. I had expected her to quote a textbook. Instead, the student mentioned that after becoming confused when reading about anaemia in a few textbooks, she had developed the diagram herself. This second year medical student clarified a topic that had challenged many students in this group (and also in many others I had facilitated).

In a facilitators' case briefing meeting, facilitators share their opinions on how their groups are working:

> Fac. B: I'm not sure how much work has gone on over the weekend. As it was a bank holiday.
>
> Others: Yeah
>
> Fac. B: Can I just say that for the record
>
> Fac. H: Well my group did what I would've done, nothing!

Fac. A: (Laughter)

Chair 1: Yeah

Fac. L: The words treacle and wading through come to mind for my group

(Laughter)

Fac. F: Well, my lot were being videoed so they were taking it very seriously!

(CBM 6_4 RV 6_3, 17:16)

This discussion illustrates how the practice of PBL within different groups at GEM varies. The way in which students engage with the PBL process is influenced by factors outside GEM like the time of year (e.g. a spring bank holiday). To what extent this occurs depends on the dynamic or culture within each group. This variability is illustrated in the discussion above.

Earlier in this section, I highlighted the question posed by Facilitator F as an important intervention that resulted in the students discussing learning issues rather than skipping this step as one student suggested. However, during the CBM, she provides an alternative explanation: the students were 'taking it very seriously' because they were being video-recorded. It is likely that many factors influence how students engage with PBL sessions

For example, the PBL cases can influence how students engage with the process. My decision to conduct my fieldwork during the renal block was influence by the positive feedback given to those cases by the previous cohort of students. The recordings I gathered relate to well-constructed cases focused on specific areas of renal

physiology. Some cases contain too much information. For instance, the students spend one PBL case studying the liver as part of the gastro-intestinal block of cases. The learning topics assigned to this case include liver physiology and pathophysiology, alcohol abuse and hepatitis (viruses, screening and vaccinations). In Section 6.3.2 I share observations of a group. They have run over the allocated time for each of the PBL sessions. While reflecting on the case and discussing why they may have overrun, a student commented, 'There was nothing we could do this week. The case was mega!' (S2, Field Note, Session 3). Since gathering that data, the content of the PBL case has been reduced and topics like Hepatitis have been assigned within other cases. This illustrates how PBL can vary week on week depending on the case being covered.

Another influence about how the group functions relate to their facilitator. This is explored in more detail within Chapter 6. Here I will highlight that facilitators come from a variety of backgrounds and practice in various styles. Section 6.5 contains an excerpt during which students compare two previous facilitators. Based on the description provided by a student, one facilitator actively engaged with the group while the other 'let us get on with it really' (SA3, PBL Group A, Session 1, 10:13:03). This illustrates how the facilitators can influence the students' engagement with PBL. Actual practices used by facilitators that also may influence students' engagement are also explored within Chapter 6.

A final observation for this section is that sometimes students do not feedback learning issues. They might do this because they feel that the issue they highlighted during session one is no longer relevant to the PBL case:

> SC6: And the other one I did or rather didn't do was about hip fractures, but I sort of realised what everyone else realised ages ago, that is not completely not relevant to this case. So I didn't actually bother with doing it. I did look to see if hip fractures can lead to strokes but when I did searches and things everything came back with if you had a stroke then you're more likely to have a hip fracture cause if you have another one you're more likely to fall over and break a hip. Um, that's all I have to say about that. So I have not done anything to talk about this week.
>
> (PBL Group C, Session 2A, 09:17:43)

Of note the student reports that he has attempted to assess the relevance of a particular learning issue to the case before deciding not to pursue it. This demonstrates how students discriminate between learning topics that are perceived to be useful and those that are not useful. However, it is unclear whether the student's decision to reject the topic in this case was influenced by other factors like the faculty-generated list of learning topics or the taught curriculum.

5.5 Impact of Assessment on Self-Directed Learning within PBL

So far I have illustrated how certain aspects of how PBL is situated within the hybrid curriculum at GEM influences students' engagement with the PBL process. The aims of PBL as described by Barrows (1986) and communicated to students and facilitators in the GEM guide on PBL highlight the importance of Self-Directed Learning:

> 'The curriculum will be covered by the PBL course, by using a number of carefully constructed cases, which will address the key areas for study . . . The intended outcome is thus for students to acquire extensive knowledge and skills in order to apply it to practical situations. This knowledge is integrated across the biomedical disciplines and is designed to assist in the analysis and solution of problems in real life situations. In other words students learn how to be critical reflective practitioners. The skills of self-directed, life-long learning are as important to learn on a PBL course as are the core knowledge and competencies of medicine.'(GEM, 2005, p. 33)

During assessment periods at GEM, students desire to acquire 'core knowledge' needed to pass assessments and progress on the course impacts their engagement with PBL and Self-Directed Learning may be adversely impacted by the emphasis placed on the faculty delivered teaching.

This seems to result from some uncertainty from students and staff about how much emphasis should be placed on SDL and the students own learning issues. In the following extract, I extend the idea of how faculty generated teaching influences SDL by looking at the impact of student assessment. Students are assessed formatively and summatively. In order to progress onto the clinical phase of the course, students must pass their end of year exams. These are heavily based on knowledge acquisition and recall relating to the pre-clinical sciences. There is no assessment of students' performance in PBL or their attainment of SDL skills. Students need to attain a certain level of competence in the sciences to pass the assessments. One of the issues highlighted by facilitators is that students separate learning science from the PBL cases:

> Fac. G: They see [PBL] as being working through a case and learning the science sometimes, I get the impression, as two separate things.
>
> (CBM 6_3 RV 6_2, 10:42)

Another facilitator offered an explanation for this behaviour:

> Fac. E: isn't that because of the way they are assessed. You're assessing their ability to understand the science
>
> CBM Chair 2: A number of the papers are psycho-social
>
> Fac. E: Right, ok, but are you assessing their ability in the final summative examination in terms of hypothesis generation, clinical, um differential diagnosis, giving a scenario, are you actually assessing their ability to carry out these processes that are going on during the PBL sessions? Cos if you were then they may, they may inevitably, being assessment driven, would maybe, they may spend more time doing both.
>
> (CBM 6_3 RV 6_2, 10:48)

Another facilitator shared the following view:

> I don't know if the students tie PBL into the assessment process. Cos you hear them talking about getting lecture notes. I think they see PBL as a different environment. To me with some of the groups I've been with before. I don't think they see the assessment coming from what they do in PBL.
>
> (CBM 6_3 RV 6_2, 14:42)

In my experience speaking to students, regarding assessments, students feel it is important to learn the material presented in the lectures and the workshops. This is believed to be the material that will arise on the assessments. Whether this belief is accurate is beyond my focus at this time. However, students who believe this may place more emphasis on learning that material rather than working through the steps of PBL. Students have mentioned that preparing learning topics takes too long and distracts them from spending time reviewing lectures or completing their

workbooks. During PBL sessions that are close to assessments, students sometimes elect to use time during PBL for revision or may choose not to attend PBL sessions, but rather study independently. PBL is deprioritised during assessment periods. This undermines the value placed on PBL in helping students progress through the course. It has been well established in the literature that assessment drives learning. I would argue that many students at GEM prioritise curriculum elements that they perceive to be more likely to be assessed (i.e. appear on the exams).

Facilitators and the course faculty have taken various steps to address these challenges. Greater emphasis was placed on making students aware that attendance to all of the PBL sessions was a 'fundamental course requirement' (GEM, 2005, p.12). The practice of monitoring attendance was modified from the initial approach of students reporting absences to the GEM office to one that involved facilitators completing an attendance register each week.

The faculty also altered the themes of the final block of PBL cases near the summative exam periods. A facilitator first introduced this idea during a CBM:

> Fac. F: I think the last block should be a potpourri of cases so [the students] have no idea what to expect.
>
> (CBM RV 6_4, 11:48)

This idea was modified before being implemented. This resulted in the final block of PBL covering a 'potpourri of cases' rather than being focused on one theme (e.g. Oncology); the cases addressed a range of themes some of which revisited topics raised in previous cases. These provided students with more opportunities to revise

previously covered material during the PBL sessions and helped to alleviate some of the tensions associated with some students disengaging from PBL during the assessment periods in order to dedicate time to revising for examinations.

5.6 Conclusion

This chapter has presented findings that explore whether or not students engage with the PBL process described in the literature. There are variations in students' levels of engagement with self-directed learning. I focused on two key steps within the PBL process at GEM: Generating learning issues and Feeding back learning issues. These are seen to be central to self-directed learning in PBL (Barrows, 2000; Blumberg, 2000). The analysis introduced the idea that influences from faculty derived curriculum outside of PBL sessions impacts upon how students engage with the PBL process. Students appear to be influenced by lectures, workshops and the anticipation of summative assessments in their choice of learning strategies. These influences conflict, at times, with the PBL process (Barrows, 2000). Students select components from the curriculum to substitute for self-directed learning both during and outside PBL sessions. This also presents dilemmas and differing opinions amongst PBL facilitators as highlighted by data from CBM.

In the next chapter, I further develop the analysis relating to the facilitators roles within PBL practice.

Chapter 6: Facilitating Problem-Based Learning

6.1 Introduction

Within this chapter I now turn the focus to PBL facilitators and their role within the hybrid curriculum. In Section 6.2 I begin by unpacking the meaning of facilitation at GEM. I look at the range of individuals who take on this role within the PBL programme and explore the range of content and process expertise held by these individuals. Within Section 6.3 I share findings of how the diverse pool of facilitators at GEM utilise their varying levels of content expertise within PBL. I introduce a Knowledge Sharing Matrix that illustrates my observations and experiences relating to how facilitators shared their knowledge or lack of it within groups. Section 6.4 examines how facilitators' learning is supported via CBM. Finally in Section 6.5, I explore the personal dimension of facilitation. This explores aspects of Charismatic Authority (Heron, 1999) along with ways in which relationships among staff members and students may be redefined within PBL (Wilkerson and Hundert, 1997)

6.2 Facilitators' Professional Identities

The following quote embodies the importance placed upon facilitating PBL at GEM, 'The heart of the educational process on the GEM course is PBL facilitation' (GEM Course, 2003, p.37). However, like 'Problem-Based Learning', the term 'facilitation' represents a wide variety of educational practices and the term 'facilitator' represents a diverse range of individuals. I include this section describing the facilitators because GEM draws upon a diverse group of individuals to facilitate PBL. In the following extract, a facilitator shares some details about himself:

> Fac. A: So, I'm (Facilitator A). I'm usually based over at [specifies campus]. I'm a non-clinical [scientist] so I, I do a reasonable amount of undergraduate teaching to the medics over there and also to the, um, other degree programmes like nursing and pharmacy etc. but a lot of my teaching is post-graduate teaching and, of course, I have, um, a reasonable amount of research interest over there mainly in [details of the speciality] so I'd have been more help in the last block, as opposed to from here on in ... I do two blocks in Derby, this is my second year. I enjoy it a lot, because it's different. And also, I've been very impressed by the kind of, the way that, um, certainly the students I've met to date seem to be able to assimilate and think about the information they are given.
>
> (PBL Group A, Session 1, 10:08:01)

This excerpt was recorded while this facilitator was introducing himself to his new PBL group. He is involved in research and teaching at the 'other medical school' on the main campus. He travels to GEM to facilitate PBL sessions. This is an additional responsibility to his main role. He has volunteered to do this. He sounds enthusiastic about his prior experience of PBL. Interestingly, he highlights the point that he is facilitating a block that does not relate directly to his specialty.

This contrasts with my own background as illustrated in the following introduction I presented when joining a new group:

> I'm Pete. I've been living in England since 2000. I am a core facilitator based here at GEM and facilitate groups during each block. I only work here two days per week. During the rest of my week, I work in the NHS as a diabetes specialist nurse. I got involved with GEM after running courses with small groups of patients teaching them how to self-manage their diabetes.
>
> (Field Note, PBL Session 1, Sept 2006)

While all of the facilitators are university educated, they come from a range of backgrounds. These include academic (e.g. lecturers, professors, clinical scientists, PhD students) and/or healthcare (e.g. hospital physicians, surgeons, general practitioners, specialist nurses, health visitors, dieticians, pharmacists, osteopaths) backgrounds.

Depending on how many blocks they facilitate each academic year, the facilitators delivering PBL at GEM can be organised into three categories: One-Blocker, GEM Staff and Core Facilitators. The basic descriptions that follow are expanded in Table 6.1 by providing details about the individual facilitators involved in my research.

One-Blocker is the informal label given to those who facilitate intermittently, approximately one or two blocks of PBL per academic year such as Facilitator A. This equates to approximately 60 hours of PBL. One-Blockers come from outside GEM, either from other schools or departments within the university or from primary and secondary care. The three One-Blockers involved in this study were all based in the medical school on the main campus. Retired clinicians are also occasionally used as

One-Blockers on a voluntary basis.

Core facilitators are employed part-time at GEM and their primary role is PBL facilitation. Core facilitators facilitate six to nine blocks per academic year that ranges from 150 to 200 hours. The core facilitators spend the most time working with PBL groups compared to GEM staff and One-Blockers. The number of core facilitators at GEM has varied in number from 7 when the programme was established to 14. The majority of core facilitators work within health care in professions associated with medicine (e.g. dietetics, nursing, pharmacy and osteopathy). Six of the core facilitators involved in this study were in this category. The other core facilitator was trained in biomedical sciences. Only one of the core facilitators is medically trained: he works in general practice.

GEM staff, from backgrounds that are either clinical or academic, vary in the amount of facilitating they do. While some staff may only facilitate one block of PBL, the majority facilitates three or more blocks per year. GEM Academics have a deeper involvement with the school than One-Blockers. They are based within GEM and are also involved in delivering other teaching such as the lectures and workshops mentioned in the previous chapter. The following table provides details about the facilitators included in this study.

Table 6.1 Characteristics of Facilitators Observed in PBL and CBM

Facilitator	PBL Group	Type of Facilitator	Profession	Base
Fac. A[1]	PBL Group A	One-Blocker	Non-Clinical Academic (Biomedical Sciences)	Nottingham
Fac. B	PBL Group B	GEM Academic	Academic (Biomedical Sciences)	GEM
Fac. C	PBL Group C	Core	Healthcare Professional (Non-medical)	GEM
Fac. D	PBL Group D	Core	Healthcare Professional (Non-medical)	GEM
Fac. E	PBL Group E	One-Blocker	Academic (Medical Education)	Nottingham
Fac. F	PBL Group F	GEM Academic	Healthcare Professional (Non-medical)	GEM
Fac. G	PBL Group G	Core	Healthcare Professional (Non-medical)	GEM
Fac. H	PBL Group H	GEM Academic	Academic (Biomedical Sciences) & Medical Graduate	GEM
Fac. I[2]	PBL Group I	Core	Academic (Biomedical Sciences)	GEM
Fac. J	PBL Group J	Core	Healthcare Professional (Non-medical)	GEM
Fac. K	PBL Group K	GEM Academic	Academic (Medical Education)	GEM
Fac. L	PBL Group L	One-Blocker	Academic (Clinical Medicine)	Nottingham
Fac. M	PBL Group M	Core	Healthcare Professional (Non-medical)	GEM
Fac. N	PBL Group D	Core (Reserve)	Healthcare Professional (Non-medical)	GEM
Fac. O	CBM Chair 1	Lead Facilitator	G.P. & Academic (Medical Education)	GEM
Fac. P	CBM Chair 2	GEM Academic	Academic (Biomedical Sciences)	GEM
Fac. Q[3]		Core	Academic	GEM

Fac. R	One-Blocker	Academic	GEM
Fac. S	One-Blocker	Academic (Biomedical Sciences)	Nottingham
Fac. T	Core	Healthcare Professional (Non-medical)	GEM
Fac. U	Core	Healthcare Professional (Medical)	GEM
Fac. V	One-Blocker	Healthcare Professional (Medical)	Not Applicable

[1] Facilitators A – H and the corresponding PBL Groups A – H were video-recorded during three PBL sessions.

[2] Facilitators I - P and the Case Briefing Meeting Chairs were observed and audio-recorded during CBM.

[3] Facilitators Q - V provided data via informal interviews or observations. The PBL group column is intentionally left blank, as they were not assigned to video-recorded groups.

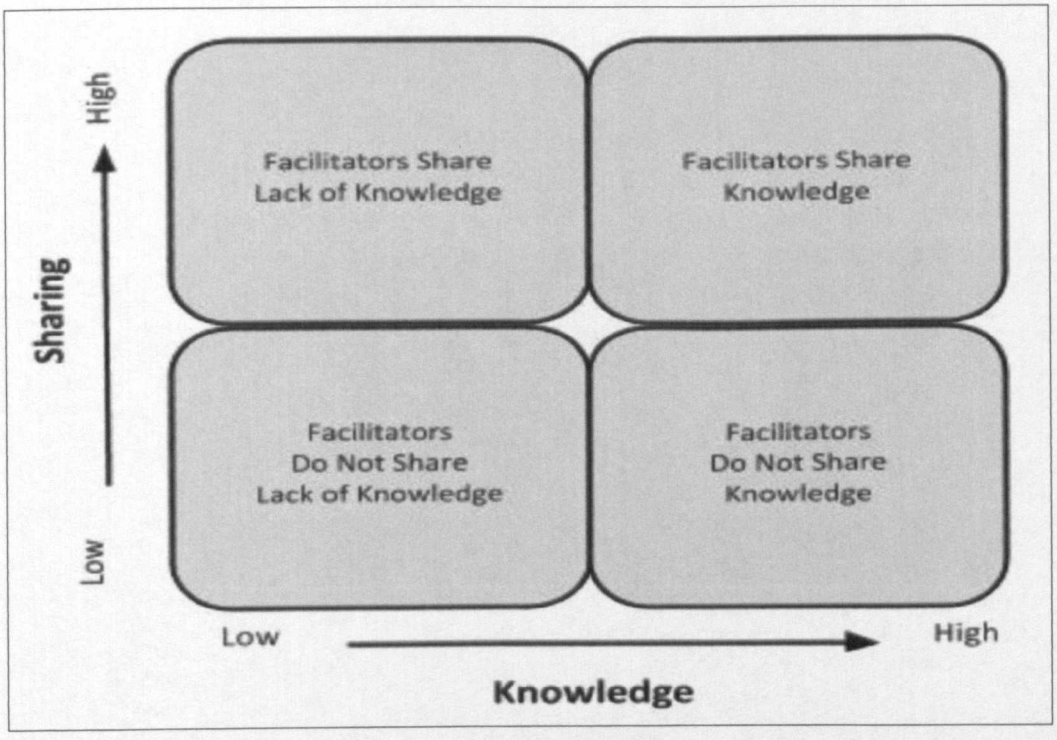
While some facilitators at GEM have medical and surgical training, the majority are not medically trained. The study group of facilitators reflects this with only two of the thirteen in the group having been medically trained. Using healthcare professionals who are not medically trained contributes to one of GEM's aims to provide inter-professional education (GEM, 2003a).

A result of using a diverse group of facilitators is that some facilitators are content experts while others are not. In the next section I explore how facilitators utilise their knowledge or lack of knowledge during PBL sessions.

6.3 Knowledge Sharing Matrix: How Facilitators Utilise Varying Levels of Content Expertise within Groups

The relative importance of facilitators having content expertise has been widely debated within the literature (Rothman and Page, 2002) (See Section 2.6.5). However, issues relating to content expertise extend beyond whether a facilitator possesses knowledge. It also overlaps with process expertise and includes whether the facilitator decides to share their knowledge or lack of it within the groups. In order to clearly structure and communicate my observations and experiences of these findings, I constructed a Knowledge Sharing Matrix (See Figure 6.1).

Figure 6.1 Knowledge Sharing Matrix



Sometimes facilitators may have knowledge relating to the case, sometimes they may not. Sometimes facilitators may share knowledge, sometimes they may not. This matrix illustrates my observations and experiences relating to how facilitators

shared their knowledge or lack of it within groups. The following subsections explore each of these quadrants in more depth.

6.3.1 Facilitators Share Lack of Knowledge

Upon returning from a CBM for the Neurology Block, I overheard one facilitator comment, 'This is my least favourite block. I don't know anything about neurology' (Field Note, 2007_12_04). This comment reflects one of the challenges frequently highlighted by facilitators at GEM: experiencing feelings of discomfort and uncertainty that stem from not knowing what the students are discussing.

These feelings appear to be prevalent within GEM even though the policies guiding facilitation state that the facilitators are not expected to be content experts, but to have skills to facilitate:

> The facilitator will be skilled in facilitation and able to recognise and manage the group dynamic as needed. The facilitator will not be an expert on the area of the problem, and indeed can be entirely ignorant of the problem area. However, the facilitator will be aware of the major intended learning issues involved in the case. Expert knowledge may even be a slight handicap as the facilitator may be tempted or invited to act as a subject resource within the group. This is counterproductive to the purpose of PBL group sessions. If your facilitator has special expertise in an area of the case, it can be utilised outside of the group process in other settings.
> (GEM 2003b, p.16)

While this claim that facilitators can be entirely ignorant of a problem area and expert knowledge may handicap facilitators, I have observed and experienced facilitators expressing discomfort when placed in this situation. In the follow excerpt, a facilitator is introducing himself to his new PBL group at the start of the Renal Block

and identifies his lack of content expertise in the current block:

> Facilitator A: A lot of my teaching is post-graduate teaching and, of course, I have, um, a reasonable amount of research interest . . . Mainly in [details of speciality] so I'd have been more help [in the previous gastro-intestinal block]'
>
> (PBL Group A, Session 1, 10:08:21)

In stating 'I'd have been more help', he is suggesting that he could use his specialist knowledge as a resource within the group during the gastro-intestinal block. This appears to conflict with the role of the facilitator 'to enable student to generate appropriate learning issues for themselves' and 'to facilitate the development of habits of life-long learning in the students' as outlined within the curriculum specification (GEM, 2003a, p.39).

There is the potential that the facilitator's statement could confuse students about his role; is he there to teach the students? It also suggests that the facilitator is unclear about whether he is there to share his knowledge when facilitating. This facilitator appears to be revealing his discomfort being in a situation where he does not know the material. During his introduction (Section 6.2), he mentioned that he spends most of his time teaching undergraduate and postgraduate students on the main campus. These are lecture-based programmes. Therefore, the facilitator is accustomed to drawing upon his expert knowledge when working with students. The effectiveness of facilitation appears to depend more on content expertise than process expertise for this facilitator. However as a One-Blocker, he spends just two blocks per year facilitating PBL and may not yet feel skilled in facilitating the process.

Returning to the issue of when facilitators disclose their lack of knowledge to their group, this may occur when they begin working together. However, the facilitator's lack of knowledge may also become apparent at other times.

During PBL students may presume that the facilitators know information and directly ask them to share their knowledge. The following example illustrates this. It occurs during PBL Session 2. While one student is reporting back on a learning issue, the students begin asking questions about urea:

> SC5: What is urea? What does it look like?
>
> SC3: How come you can use it in sun lotion? That's what I want to know.
>
> SC6: Has anyone got a pen? (Standing up)
>
> SC1: You know what it looks like?
>
> SC6: I think I do, yeah (He then reaches toward the whiteboard on his left and begins drawing). I'm sure (Facilitator C) can [unclear speech] me
>
> SC3: (looks at Facilitator C)
>
> SC5: You've just drawn a molecule!
>
> Group: (Laughter)
>
> SC6: I think that's right (looking at Facilitator C). Is that? Does that?
>
> Fac. C: I wouldn't know actually.
>
> SC6: No? Oh! OK, I'll double check.
>
> (PBL Group C, Session 2A, 9:33:32)

In this vignette, the student appears to expect the facilitator will know the molecular structure of urea. The student literally looks to the facilitator to confirm the accuracy

of his illustration. At this point the facilitator confesses, 'I wouldn't know actually.' The students responds mildly surprised and then assumes responsibility to check the accuracy of his drawing.

These two examples also highlight how some students' and facilitators' expectations that facilitators should have expert knowledge relating to the case and also that facilitators will share this with the group. This contradicts formal guidance given about facilitation at GEM:

> 'Specific medical expertise relating to the content of each PBL scenario is not a requirement. However, an ability to grasp the relevance and context of anticipated learning issues in the cases is essential.' (GEM Course, 2003, p.38)

This highlights an important difference between ideas of facilitation at GEM and an aspect of Heron's concept of facilitator authority (2000). Heron highlights the idea of Tutelary Authority, which stresses the importance of facilitators possessing expert knowledge in the subjects they facilitate. This important component of facilitator authority appears to contradict the approach at GEM highlighted within these documents. What makes this contradiction interesting is how Heron's model of facilitator modes and dimensions has played an integral role in facilitator training at GEM, but this concept of facilitator authority has not.

6.3.2 Facilitators Share Knowledge

The following extract illustrates a different approach where the facilitator shares his knowledge with the students. This occurs as the facilitator responds to a student's question during a discussion about how sperm are formed:

> SH6: (Turns to the facilitator who is sitting quietly) Is the plural of sperm, sperms?
>
> SH5: No, it's sperm.
>
> SH2: Spermatozoa
>
> The facilitator doesn't appear to hear her, but turns to look at the student and then leans closer and tilts his head. The student repeats the question:
>
> SH6: Is the plural of sperm, sperms?
>
> SH2: One sperm
>
> SH6: Or what she just said?
>
> SH2: Two sperm
>
> Fac. H: Sperm is short for spermatozoa or -zoan singular, -zoa plural.
>
> SH3: You can use sperm for both anyway.
>
> (Brief silence)
>
> SH2: We probably need to learn
>
> Fac. H: There's a dictionary somewhere
> (He looks down at the table and begins moving his hand around it as if he is searching for the dictionary.)
>
> (PBL Group H, Session 1, 10:10:52)

In this extract even though SH2 answers the question, SH6 repeats her question to the facilitator. He, in turn, provides an answer. Here the facilitator is sharing his knowledge within the group. What is interesting is that he then mentions the

dictionary and encourages the student to use it. It is as if he is catching himself sharing knowledge and tries to correct this action by suggesting the dictionary.

Facilitators may use their knowledge in a variety of ways. One approach is to instruct students. This approach of sharing knowledge during PBL may be viewed by some as contradicting the aims of PBL and the role of facilitators (Barrows, 2000). It may, however, illustrate a facilitator adopting a more hierarchical approach to facilitation (Heron, 1999).

This is illustrated within the following field note from a first year PBL group at GEM. It is Session 3. The session is still running even though it is 30 minutes beyond the scheduled end time. The group is studying the liver and have talked about a number of topics like liver physiology and pathophysiology, alcohol abuse and hepatitis. They have been discussing how to interpret the results of a blood-screening test for Hepatitis B and C and move onto vaccinations:

S2: And there's no vaccination against Hep. C.

S3: Yeah

S2: So there's nothing we can really do apart from manage her symptoms.

S1: But can you not get from? A percentage of people who've recovered from it have the antibodies and that was

S2: That's Hep. B.

S1: Was it?

S3: Um

S2: Because of the quasi-virus status of Hep. C, even if you're able to inject against some, you're not going to be able to inject against all. Surely, so you're never, you, it won't be the same for everybody so it's very difficult to get one vaccine that is going to sort out the whole lot.

S5: What do you mean by the quasi-virus?

S2: There are lots and lots of different types of Hep. C, and they're all sim

S5 How do you spell 'Quasi'?

S2: Q-U-A-S-I, like, Latin, like one another.

S5: Q-U-A, oh, Qua, Oh, right, right.

S2: Quawsi

S1: So, if they're all infective, how come it's called, 'Type 1' or whatever it was?

S2: I don't know.

S1: Mmm (Plops her chin into her hand)

S3: But you don't necessarily know she's got qua, quasi

S2: It only exists as quasi virus, I thought. I think that you did only just get one type of Hep. C.

S3: Oh, right (nodding head up and down).

S1: So, but

Fac. A: I could do a very quick diagram. Just to (unclear speech)

Group: Ohhh (Students sit up straight, some clap)

Fac. A: and only because its 5 past 11

Group: Yeahhh (The excitement builds)

Fac. A: Have you got a pen? Here's a pen. (The facilitator leans forward in his seat and grabs a marker on the table. He stands up and walks to the whiteboard). Because it's not that important, I don't want you to get bogged down by it.

S1: Oooeeee

S2: (Fac. Name)-is-writing-on-the-board (Said in a voice that sounds similar to a chanting school child)

S4: Oooohh

Fac. A: (Points to cameraman) Don't record this! (Laughs)

Group: (Laughter)

The camera focuses close up on the whiteboard and the facilitator can be seen drawing a diagram. After a moment, the facilitator begins instructing the students:

Fac. A: Right, so, those are your six genotypes. If you then focused in on that (drawing on the board)

He then spends just over three minutes explaining the difference between genotype and quasi-virus to the students. He wraps up by saying: That's a quasi species (pointing to one side of the diagram) and that's a genotype' (pointing to another side). As he finishes, two students shout out:

S3: That was great!

S4: Thank you very much.

He moves to sit down, but returns to draw on the whiteboard again where he spends another minute chatting to the students before sitting down. He then provides answers to the students' questions for approximately two minutes until the students shift their discussion onto a different topic. The facilitator leans back and listens to the students discussing their ideas.

Later after the case finishes the students spend approximately five minutes reflecting on how they worked through the case. Nearly all of the students praised the teaching during their feedback:

S4: Thanks for some tips today.

S7: 'Spot on, really good, that was really helpful.' (Pointing to diagram)

(Field Note[23], Session 3, 11:03:55)

This observation highlights a range of approaches that a facilitator may choose to

[23] This recording of PBL at GEM was collected as part of the PESL Project (http://pesl.nottingham.ac.uk). This clip was used within a facilitator training session. Therefore, I have recorded it as a field note to reflect this difference from the observations I collected.

adopt during a PBL session. For much of the session, he adopts an autonomous mode (Heron, 1999) as the students appear to function independently. Student S2 appears knowledgeable about hepatitis viruses and shares this openly with the other students. I observed the facilitator occasionally nodding his head up and down as this student was talking or giving a thumbs-up signal to show students that the explanations were correct.

When the students struggle to make sense about genotypes and quasi-viruses, the facilitator asks the students if they'd like him to provide some information. Here there's a shift into the cooperative mode as the facilitator negotiates with the students. He then adopts a hierarchical mode as he begins teaching them about the relationship between genotypes and quasi-viruses. After he finishes his explanation and answering questions from the students, he reverts again to an autonomous mode. Interestingly, the facilitator's jest to the camera, 'Don't record this!' indicates a tension: should he be teaching or not?

I feel his actions are justified. This observation provides an opportunity to see in practice what Papinczak et al. describe as

> 'The balance that tutors must find between providing relevant information to keep group discussion focused and relevant and allowing the session to evolve in line with the self-directed nature of PBL' (2009, p. 381)

In the observation above, the facilitator's 'judicious use' (2009, p.381) of teaching provides clear guidance to students as they struggle to differentiate genotypes from quasi-viruses, a distinction that in the facilitator's opinion, 'Is not that important.'

The facilitator's explanation was welcomed by the students and helped to move the discussion along to the next point. This was important as the session was already running 30 minutes behind schedule. It finished one hour late. This observation illustrates how an intervention like teaching, which is widely perceived to go against the practice of facilitation, can support the process especially when the PBL case contains a number of complicated learning areas and the session is running beyond its allocated time.

6.3.3 Facilitators Do Not Share Knowledge

So far, I have explored how facilitators share their knowledge or lack of knowledge within PBL. I now shift my attention to explore situations when facilitators choose not to share their knowledge.

In the following excerpt, a student turns to the facilitator, who has been quietly observing the students discuss postural hypotension, and asks for feedback about points raised by students.

> SB3: What do you think about that level of detail? Is that sufficient or?
>
> Fac. B: I'm not wearing a [subject specialist]'s hat. What do you think about that level of detail?
>
> Group: (Laughter)
>
> SB5: [Facilitator's Name], you've been taken over by the dark side.
>
> Fac. B: How does that suit you? (Laughs)
>
> SB1: It's that camera isn't it?
>
> SB7: [Facilitator's Name], come back

Group: (Laughter)

SB2: maybe we should ask you again at 10:30
[The end of the PBL session]

(PBL Group B, Session 2A, 08:24:31)

Here the student attempts to utilise the facilitator's expertise. The facilitator declines to offer an explanation, 'I'm not wearing a [subject specialist]'s hat' and deflects the question back to the student by asking, 'What do you think about that level of detail?' This response aligns with guidance on facilitator (Barrows, 2000). However, the response sparks some banter and cajoling from the students. They are keen to tap into their facilitator's knowledge and continue to prod.

What complicates this situation is that while facilitators are encouraged not to teach students during PBL at GEM, students may approach them after the session is finished. At this point their guise changes from facilitator to an expert resource (Barrow, 2000). Student SB2's comment alludes to this point. This may explain why a facilitator chooses to share knowledge with students during a session even though this facilitator does not share information, at least not yet.

While initially not answering the student's question, a few moments later the facilitator does concede and offers guidance drawn from his specialist knowledge:

SB3: Well, I think if you're writing short answers and getting [full] marks that would be about fine. That would be about five decent sentences worth.

Fac. B: I would think that rather than just (pause) learning from a diagram like that, that it might be useful to think about what you, what you sort of comp, rather than just saying this is what happens to bring the blood pressure back up to a normal level or to reduce blood pressure down to a normal level. I think it is worth thinking about what the compensatory responses might be. How would you see whether these things were working or not?

SB3: Yeah, OK.

Fac. B: Whether they were acting properly

SB3: Um

Fac. B: Rather than thinking about something that acts in the heart, something that acts in the blood vessels [clears throat] if you can think of it in terms of a more organised whole. There are some really nice, easy equations to remember.

SB3: Oh, all right (smiling and nodding head up and down).

Fac. B: Along the lines of V=IR, for example.

SB2: Oh, yeah.

Fac. B: I'll get that hat back off now (pretends to remove a hat from his head and places it beside his chair).

SB3: Thank you.

(PBL Group B, Session 2A, 08:24:54)

The student who initially asked the question appears satisfied with her answer and resolved to use it if needed during an exam. At this point the facilitator sees the need to steer the students toward a different way of thinking. He encourages her to move away from looking at separate parts (e.g. heart, blood vessels) to 'think of it in terms of a more organised whole.' This point echoes the point I raised earlier that highlighted the tensions between sharing knowledge and facilitating students' self-

directed learning. On one level of analysis, this excerpt provides evidence of the facilitator 'breaking the rules' of telling students answers. However, these actions can also be seen to facilitate learning. This excerpt demonstrates a conceptual change (Biggs, 2003) whereby the facilitator is encouraging the students to move from thinking about separate parts to a holistic view. Yes, he is providing answers (e.g. 'There are some really nice, easy equations to remember... along the lines of V=IR, for example') and arguably spoon-feeding the students, something PBL positions itself against (Barrows, 2000). However, he could also be seen to be modelling an alternative conceptual view to the students. From this perspective, his actions could be aligned with the theory of Cognitive Apprenticeship (Collins et al., 1989), a theory that underlies Barrow's concept of facilitation. The role of the facilitator varies from first *modelling* desired approaches to the students to then *coaching* them to adopt these approaches to, finally, *fading* as students begin to demonstrate these approaches independently (Barrows, 1988). Therefore, from this theoretical perspective, his actions could be justified. The facilitator's actions could be interpreted as him modelling an approach (i.e. adopting a holistic view) to the students.

6.3.4 Facilitators Do Not Share Lack of Knowledge

The final quadrant within the Knowledge Sharing Matrix relates to situations when facilitators do not have the knowledge about what students are discussing, but they do not share this with the students. At times facilitators may act like they do:

> As Fac. D entered the office after the PBL session she exclaimed: 'Ohhh, my neck really aches. All I've done for the past 2 hours is nod my head. I didn't have a clue what they were talking about!'
>
> (Field Note, 2007_02_20)

This point was again raised spontaneously during a social gathering some time later, when the same facilitator reflected on her role in PBL:

> Fac. D: 'I spent a lot of time pretending to know information and I ended up feeling a bit like a fraud.'
>
> (Field Note, 2011_09_23)

This facilitator's phrase 'pretending to know' nicely describes this quadrant. The other facilitators shared this feeling. I am also familiar with it and understand the rationale behind pretending to know. In my experience of facilitating groups, being put on the spot and having to say, 'I don't know' feels slightly embarrassing. An example of this is a situation when the group is having a quiz. I encourage students to use quizzes as a method for feeding back learning topics. They promote discussion and the added competition between students can raise energy levels. I enjoy observing students using this method. However, if I am invited to join a team of students and take part in the competition, I begin to feel anxious. This feeling arises from a tension. On the one hand, I enjoy taking part in these games. However, doing so and playing fairly, means that I set aside the facilitator's guide, the source of my

'knowledge' of the case. During these moments, I can feel exposed if I repeatedly do not know the answers to questions and my guesses are wrong. As a result, the students can become aware of my limited understanding of a topic. I feel like I lose face.

However it is important to also recognise that pretending to know can be a tool facilitators use to encourage discussion among the students. If nodding one's head or asking a question fuels a discussion within the group and this subsequent discussion leads students to gain a deeper understanding of a topic, then whether the facilitator is pretending to know may not be as relevant to the students learning. 'Nodding unknowingly' could ultimately benefit the students even though pretending may cause discomfort for the facilitator if that behaviour by the facilitator is used to promote the exchange of ideas amongst the students.

During other situations like informal discussions, I can casually glance at my facilitator's guide and use it to harvest points or to raise relevant questions. However, I recognize that this is a covert way of masking my lack of content expertise. This resembles the approach described earlier of nodding one's head without actually understanding the discussion.

6.3.5 Facilitators' and Students' Perceptions about Knowledge Sharing

Among some of the facilitators there appears to be a feeling that students prefer a facilitator who possesses expert knowledge of the subject being studied during PBL. This is illustrated in the following extract from my field notes:

> Spoke to Fac. D, Fac. R and Fac. F during the case briefing meeting.
> Fac. R mentioned that she was struggling with her group:
>
> Fac. R: 'I'm not sure why I'm there. They're waiting for the session when they have another doctor as their facilitator!'
>
> (Field Note, 2003_12_03)

A similar issue was again raised during an interview I conducted with a non-medical colleague who highlighted the challenges she faced within a PBL group of second year students:

> 'I also think their views were too entrenched by the start of the second year to change too much. Now, whether they would have changed more with a different facilitator with more experience, I don't know or whether they'd got their desired wish. What they actually want is a medically qualified facilitator who will give them more medical information, I think.'
>
> (Fac. Q Interview, 2005_04_08, 60)

In both extracts the facilitators are struggling with their groups. It is interesting that they both perceive having medical training as the solution to the difficulties they encounter. Not fitting into a group can feel very uncomfortable and can prompt facilitators to seek explanations like those offered in these extracts.

However, this perception held by some facilitators may be borne out by the opinions voiced by some students as illustrated in the following example:

At the end of a PBL session, a few minutes after the facilitator left the room:

SE3: I like (Fac. E).

This sparked a brief discussion about facilitators and the students' preferences for facilitators.

SE6: 'I think the best, best facilitator is a medic'

(PBL Group E, Session 1, 12:06:29)

However even though this student's opinion supports this idea, the facilitators' logic may be oversimplified. In another extract a medically trained facilitator reported feeling like a 'foreign body' within his group (See Section 6.4.2.). This suggests he felt disconnected from the group. It also supports the notion that possessing content expertise does not necessarily make it easier to facilitate a group (Maudsley, 1999).

Fac. Q's assumption that medically qualified facilitators will automatically share their knowledge is also questionable. Facilitators who have knowledge about the subject area, whether medically qualified or not, also have the option to use this to guide the questions they pose to the group rather than providing answers. In my experience of facilitating PBL cases relating to diabetes, I do not default to a style where I provide answers to the students. Rather, I use my knowledge of diabetes and experience of working with patients to guide the questions I ask.

This contrasts with situations when I am not as familiar with the topics of a PBL case. In these situations I rely upon the prompts in the facilitator's guide and points covered during the CBM to guide my questions. However, difficulties can still arise.

When students raise discussion points relating to topics that fall outside those raised in the facilitator's guide or the CBM, I do not feel as confident. In these circumstances, I may either remain quiet or ask the group 'Is that what everyone else understands?' While this question may draw views from other students, it can feel uncomfortable. At times, I feel as though I should know the material, especially if I recall studying it when I was a student at university. Blindly steering a discussion can also become problematic. In practice situations have arisen when after I have posed a question like, 'What do other people understand by ...?', the students may then begin to doubt what they thought they knew because they misinterpreted my generic question as a prompt that they were missing an important point. In an attempt to reconcile this, I have encouraged them to 'just ignore my last question.' Without the knowledge, I am steering a discussion without knowing which direction it is going. When I have background knowledge, I feel more certain about how to navigate the conversation and where the endpoint of the discussion lies.

The findings presented in this section provide new insight into how facilitators may or may not share their knowledge or lack of it within PBL groups. The existing literature on facilitators' content expertise focuses mainly on whether expertise influences students' learning (Rothman and Page, 2001). These findings focus on how this impacts the facilitators themselves, their perceptions of what students want, their discomfort with not knowing and their uncertainty about how to use knowledge or nonverbal communication to facilitate discussion during PBL. It also highlights situations within PBL when sharing knowledge appears to support the learners, for example by modelling desired behaviours.

In the following sections I focus on support provided to facilitators at GEM to assist them to develop their understanding of the subject matter contained within the PBL cases. Despite the information in the GEM PBL Guidebook suggesting content expertise is not required (2003b), GEM has provided opportunities for facilitators to improve their knowledge.

6.4 Supporting Facilitators Learning via CBM

The CBM is a space where facilitators gather each week. The CBM serve various functions. One of these is the opportunity for facilitators to learn about the material intended to be covered during the upcoming case. This activity is referred to as 'briefing the case.' This activity takes place in a meeting room. The table and chairs are always arranged into a circle before the meeting begins. The PBL Staff Development Officer pays special attention to this detail. It reflects an idea that facilitators mirror PBL in their own practice. Occasionally, if the circular layout of the tables has been changed, time is spent before the meeting begins rearranging the circle. Approximately, fifteen people attend these meetings each week. The facilitators involved in PBL for that block attend the meeting, the chairperson who is frequently the Staff Development Officer, and a content expert. Much of the time during CBM is spent with the expert working sequentially through the case and talking through details. The exact format can vary depending on who the expert is that week. During the Renal Block CBM, a consultant renal physician was the expert and briefed all three of the renal cases. The fourth case on prostate cancer was

briefed by the chairperson, a general practitioner, and did not include an expert in this specialty.

During the first three CBM observed and audio-recorded during this study, the consultant renal physician worked through the case material highlighting key points. He then expanded on these by providing background information to the facilitators. The following extract illustrates this. The expert is briefing a case about a man who develops acute renal failure. He draws the facilitators' attention to one of the four medications listed in the man's current medications and highlights its relevance to the case:

> Case Expert: Well, um, it's mentioned twice, really, that the patient is on an ACE inhibitor, Perindopril. And that is relevant because, um, being on an ACE inhibitor will predispose you or increase your risk of developing acute renal failure in the presence of hypovolaemia. They may want to explore the mechanisms for that. Which is basically that, um, the ACE inhibitors cause, um, vasodilation in your efferent and afferent arteriole. Um, more in your efferent than afferent and in that way they lower glomerular capillary perfusion pressure, um, which makes you more susceptible to changes in your systemic blood pressure, um, so, um that is relevant from that point of view.
>
> (CBM 6_2 RV 6_1, 17:21)

Here the information relates to the biomedical principles of how a drug acts in the body. A large amount of detail is covered. One could argue more than facilitators need to know in order to facilitate the case since, according to the GEM guidance, their role is not to teach this information to students (GEM, 2003b).

However, considering Heron's concept of tutelary authority, this approach could be seen to support the facilitators understanding (1999). This understanding may be conveyed in many ways. The previous excerpt illustrates this occurring via an explanation.

In addition to explaining the scientific components of the case, the case expert may also provide interesting anecdotes from clinical practice. The following comments were made while briefing a case relating to chronic kidney failure:

> Case Expert: Then it says he's noticed that his urine has been frothy and that is relevant because that is a symptom of proteinuria. I always used to think, it is written in all the textbooks, and I always used to think that was a fairly stupid thing to write in a textbook because no one ever really comments on it. But a couple of years ago, I had a school headmaster who, literally, one of the first things he told me, he said, 'You know, doctor, I've noticed that my urine is frothy, and I'm a keen tropical fish keeper. I know that if there is too much protein in the water in my fish tank it means it becomes frothy. So does that mean that there is too much protein in my urine?'
>
> Group: (Laughter)
>
> Case Expert: So, obviously, our patients do think about things more than we give them credit for
>
> Fac. P: So just like the GEM course.
>
> Group: laughter
>
> (CBM 6_3 RV 6_2, 20:12)

I regularly retell this anecdote to my students. It provides both a memorable example explaining the cause of frothy urine and the unique insight this patient gained about his health from his hobby. I include it here to illustrate that the

information the case expert passes along to facilitators during the CBM extends beyond simply lecturing about the science underpinning the cases. It also includes anecdotes from clinical practice. These stories can bring the scientific concepts to life. Facilitators may share these with the students. In doing so they not only pass along factual knowledge garnered from the content expert but also their shared insights from clinical practice.

As the case expert is speaking, the facilitators are looking down and appear to be reading through the documents relating to the case: Trigger Text, Facilitator Guide, Patient Data Sheets and Case Summaries. These are sent via email or accessed via a website. Facilitators print and bring these to the CBM. Occasionally copies may be available at the meeting. Many facilitators capture the information conveyed by the case expert by writing notes onto these documents. Facilitators then take these into PBL sessions where they can refer to the information contained in the guides and also recorded during the CBM.

Interestingly, the educational approaches used during the CBM reflect didactic teaching. The CBM becomes a lecture. The content expert assumes the role of the teacher. The facilitators become the learners who listen attentively and record relevant information as notes on their facilitator guides. In one sense it is ironic that facilitators are preparing for PBL using this traditional approach that appears to be at odds with the constructivist learning theories underpinning PBL. This highlights broader tensions between PBL and the taught components of the hybrid curriculum. I do see the merit in adopting this approach. Information pertaining to the cases can

be quickly passed along to facilitators via this lecture format. This may also alleviate any further need for facilitators to dedicate time to learning the material or seeking answers to their questions. I return to explore this point by sharing facilitators' reflections of the CBM the end of the following section.

6.4.1 How Expert Teaching Influences Facilitation

Interestingly, audio-recording CBM and video-recording related PBL sessions enabled me to capture unique data that highlights how facilitators used what they had learned during the CBM to guide the students as they explored the case material. The next extract from a CBM is followed by observations recorded in two different PBL groups.

During this extract, the case expert highlights information presented in the history:

> Case Expert: The basic case is a 20-year-old lady who presents with weakness and light-headedness . . . Even the term 'light-headedness' is quite a vague term. So what sorts of conditions are associated with light-headedness and what do we normally mean by light-headedness . . . as opposed to dizziness? So, I mean normally when someone talks about light-headedness, most people will mean a feeling of their head going fuzzy and a feeling of faintness. Dizziness may sometimes be used to refer to the same thing but it often refers to vertigo. There's a rotational element. It feels like the room is spinning; and, that's an essential distinction, which although it's a matter of semantics, it's quite important to separate those two out because you go down two very different diagnostic pathways depending on which it is. Um, an important clue you get in the history is that the light-headedness is particularly precipitated by rising from a seated position; and, that very strongly suggests that you've got a postural drop in blood pressure caused by hypotension.
>
> (CBM 6_1, 06:14)

This extract illustrates how the consultant shares his expertise with the facilitators.

He does this first by drawing attention to 'light-headedness', a word presented in the trigger text. He compares light-headedness to dizziness or vertigo and explains the different biomedical causes behind these symptoms. He then highlights the significance of accurately distinguishing between these terms within the clinical contextual relevance, 'You go down two very different diagnostic pathways depending on which it is.'

The extract provides another example of how the facilitators' learning is supported by expert teaching during CBM. In addition, it provides a point of reference to illustrate how the facilitators may apply what they learn in the CBM during PBL. Both of the facilitators I observed on the video recording during Session 1 of that PBL case raised this point regarding the differences between light-headedness and dizziness with the students. A few moments after reading the trigger text to the group, the facilitator prompts the students to begin discussing what they have heard:

> Fac. A: What are the things that leap out at you? Remember her age, twenty-year-old woman.
>
> SA4: How many think she's slim, petite?
>
> Fac. A: She's looking slim.
>
> SA2: The fact that she's feeling, dizziness.
>
> SA1: Postural Hypotension?
>
> SA3: Yep.
>
> SA2: Nice one.
>
> SA1: I was itching to say that.
>
> Group: (Laughter)

SA6: Shall we write things here? (Standing next to the whiteboard, tapping on it)

They briefly discuss how to utilise space on the whiteboard and then return to their discussion:

SA6: So

SA3: Um

SA6: Are we putting postural hypertension?

SA1: Well, you could put

SA6: Symptoms

SA2: Put dizziness, and then do from dizziness, could cause dizziness

SA4: Weakness, light-headedness

SA2: Yeah

Fac. A: Is dizziness and light-headedness the same? (SA1 and SA6 look at Facilitator) I'm not saying they're not; I'm quite intrigued, by, this

SA1: Mmm

SA2: Yeah

SA6: Should we put light-headedness as a separate thing?

SA1: Yeah

SA4: Yeah, did she say she was dizzy?

SA1: No, it says she's light-headed and she's nearly fainted.

(PBL Group A, Session 1, 10:28:20)

In the other group:

SB7: We need to put anx, anxiety down for light-headedness.

SB3: Oh, yeah.

SB7: That's the main cause.

SB3: We didn't get that.

SB1: It all makes sense!

Fac. B: What makes you say that?

SB7: It's in that book.

Fac. B: Oh (nods his head up and down), which book's that?

SB7: Davidson (leaning over the table and pointing at book). Anxiety is the most common cause of dizziness in the under 65's.

Fac. B: Dizziness?!

SB3: Yeah, is dizziness the same as light-headedness?

SB5: Controversy!

SB3 picks up a book

SB7: Isn't dizziness the same as fainting?

SB1: If you spin round really fast, you don't feel like you're going to faint.

SB2: Is there something physiological going on with anxiety?

SB3: Neither light-headedness nor dizziness is in this dictionary!

SB1: I think, it's not so much that we need a dictionary definition, but we need to know what she means. I think it's a psycho-social issue.

SB3: But there might be a physiological difference.

SB2 reaches across the table and picks up the book that SB7 pointed to earlier and begins looking at it. SB5 and the facilitator begin talking about pharmacology.

A few moments later:

SB2: This thing with loss of balance and light-headedness, in this book here, Davidson's, its, um, the top box is 'Funny Turn' or 'Blackout.' And then it subdivides that into 'Sensation of Movement' 'i.e. Vertigo, Loss of Balance, Light-headedness' . . . So it's splitting up light-headedness from loss of balance and putting different causes for both as well.

SB1: Oh, all right, cool.

SB3: Yeah, so dizziness, best to refer to it as loss of balance.

(PBL Group B, Session 1, 11:01:27)

Both of these extracts illustrate examples of the facilitators guiding students to consider a specific issue highlighted by the expert during the CBM: distinguishing between light-headedness and dizziness. In both groups, the students used the terms interchangeably. A student in Group A (SA2) mentions, 'The fact that she's feeling, dizziness' even though the term does not appear in the trigger text. Student (SB7) in Group B makes a similar assumption when quoting from a textbook, 'Anxiety is the most common cause of dizziness in the under 65's.' The facilitators both question the students: 'Is dizziness and light-headedness the same?' (PBL Group A, Session 1); 'Dizziness?!' (PBL Group B, Session 1).

The facilitators' interventions steered the groups to question and to explore whether these terms were interchangeable. These examples highlight how the students are guided by the facilitators to explore issues rather than identify these points themselves. However, rather than adopting a hierarchical approach (Heron, 1999) and explaining the difference to the students, the facilitators appear to acting cooperatively with the students (i.e. by asking a question and then giving students space to explore it). Interestingly, Facilitator A followed his question with the statement, 'Is dizziness and light-headedness the same? I'm not saying they're not.' Having been present at the CBM and hearing the expert's explanation, he will likely know they are not the same. This statement is a subtle tool used by the facilitator to

leave the possibility that they might share the same definition. The students are left to find the answer. So here, although the facilitator has 'the answer' or content knowledge, he elects not to share this.

In addition to this, these examples clearly map how knowledge held by the consultant physician may be passed onto facilitators and how facilitators subsequently applied their learning during PBL to assist students in identifying a relevant learning issue. In these examples the consultant's knowledge was filtered to the students via the facilitators. This illustrates the cascade-training approach described in Section 4.5.2.4.

While observing the CBM, I noticed that the facilitators spent much of their time listening to the expert essentially teach them about the case material. While this may appear to be at odds with the educational approach adopted within PBL, these extracts demonstrate how the facilitators apply what they learn during the CBM to their practice facilitating groups. All of these extracts illustrate the emphasis that is placed upon teaching the facilitators or developing their content expertise. The facilitators may then use this information in practice either to direct them in their questioning of students or to share the knowledge imparted by the expert. This level of detail that is taught to facilitators during the CBM is in tension with the stated aims of facilitation at GEM as discussed previously and highlighted below:

> The facilitator will be skilled in facilitation and able to recognise and manage the group dynamic as needed. The facilitator will not be an expert on the area of the problem, and indeed can be entirely ignorant of the problem area. However, the facilitator will be aware of the major intended learning issues involved in the case. (GEM, 2003a, p.16)

The case expert provided more detailed teaching than simply raising 'aware[ness] of the major intended learning issues' (ibid). However, as demonstrated in the previous examples, this information was used to guide the group to identify pertinent learning issues. Essentially, facilitators were using knowledge they learned during the CBM to facilitate an important step in the PBL process, guiding the students to identify learning issues. Rather than being 'entirely ignorant of the problem area,' having knowledge may assist the facilitator in guiding the students through the PBL process. This idea aligns itself to Heron's concept of Tutelary Authority where facilitators are expected to have both content and process expertise (1999).

The communication in CBM does not only go in one direction from the case expert to the facilitators. In the following observation, the expert discusses findings from a urine test conducted on a man with chronic renal failure. A facilitator interrupts to ask a question:

> Case Expert: And it is quite common to find some white cells and some red cells in the urine with glomerulonephritis.
>
> Fac. P: Can I just ask about this raised ESR?
>
> Fac. L: Yeah.
>
> Case Expert: Yeah, I mean, again, that's, um, that's moderately elevated. Um, it's quite common to find a raised ESR with hypoalbuminaemia. And it's a non-specific kind that doesn't really help you either way.
>
> (CBM 6_3 RV 6_2, 34:40)

This extract illustrates how facilitators actively refine the information provided by the consultant during the CBM. Clarifying whether an abnormal blood test is relevant to this condition is useful information for the facilitators. Students can spend a lot of time searching for an explanation to help them understand why a blood test is abnormal. In this case, the test appears to be of little use. Knowing beforehand whether this abnormal result is relevant to the students' learning can help facilitators guide the students away from spending time during the session searching for an explanation why this test is elevated.

In addition to asking the case expert questions, facilitators may also raise points that add another dimension to the material being discussed:

> Fac. B: Sorry, can I just interrupt? The, um, blood pressure, you were saying that would be very low for someone who would normally be hypertensive . . . Would you expect them to know how long these medications the ACE inhibitors and the diuretics will likely remain in the system, therefore? Would you think that
>
> Case Expert: Um,
>
> Fac. B: He's been lying for two days
>
> Case Expert: Yeah,
>
> Fac. B: He'd have none of those in his system so
>
> Case Expert: Sure, yeah, yeah. I mean that's a good point, so, particularly given the fact that he's had no medication for 48 hours
>
> Fac. B: Yeah
>
> Case Expert: That's a, that's a low blood pressure.
>
> (CBM 6_2 RV 6_1, 24:42)

During this exchange, the facilitator is contributing to the discussion and building upon the point made by the case expert. This additional information can later be used during PBL to highlight the severity of this patient's condition to the students. Rather than passively sitting through the CBM listening to the expert, facilitators engage in discussions to clarify and refine their learning. Facilitators, for the most part, appear to use their knowledge to guide the students learning. While this may appear to contradict the guidance provided to facilitators at GEM, it is consistent with the broader aims of PBL facilitation (Heron, 1999; Barrows, 2000).

Facilitators expressed a range of opinions about the value of expert guidance provided during the CBM for this block. The following extended excerpt is from the final CBM when facilitators were asked to reflect on the value of CBM. It particularly highlights the issue of supplementing facilitators' knowledge:

> CBM Chair: I did know that [Fac. F] wanted to discuss something about these meetings earlier.
>
> Fac. F: All I wanted to say is that I quite enjoyed having [the case expert] go through the narrative and point out the pros and cons of each bit and why bits of information were there. And I thought that was quite useful. I know we did it initially, and we decided, we maybe, we didn't need that. But I, actually, did find that quite helpful. (Unclear speech) Rather than just be presented with it and think 'Oh what questions do you want to ask?', I think it is, actually, quite nice to have it explained.
>
> Other: Mmmm
>
> CBM Chair: I'm picking up a couple of nods there
>
> Fac. I: I do, as well. Because of, um, you know, I've got no clinical training. So, you know, I do like to know the relevance of different things. And when we don't do that, I go away and just ask everyone else the questions, you know.
>
> CBM Chair: So you feel it helps the facilitation?

Fac. I: I think it does. Yes, definitely.

Fac. C: If there's an expert like [the case expert], I got quite a lot from that as well,

Fac. F: It needs to be an expert.

Fac. C: If it's not, I don't, I think we've got different agendas really. I don't get anything out of going through (unclear) or, you know, I'd much rather just go in and focus on facilitation.

CBM Chair: How do you decide which bits are going to be helpful and which aren't?

Fac. C: Um, it depends who, if there's an expert here, I would find it more useful to come and listen. If there isn't an expert here, I'd like to come if it's an area I don't feel confident in myself. If it's an area I think I know, and there isn't an expert here, I don't get anything out of it. And I'm concerned about having to go through it again for the third time when we start again in September. I know I've said this before, but

CBM Chair: You'll be very familiar with the cases.

Fac. C: I will. I think I will, yeah. By the time I've gone through the case a third time, I'm not sure how much I'm going to get out of it when we go through it line by line, and I just get quite frustrated.

Fac. I: It is not necessarily line-by-line. It's sort of summarising each, you know, section.

Fac. C: Yeah, but, yeah, not necessarily going through it line by line, word for word, but, yeah in quite a lot

Fac. G: I think that is partly because [the case expert] always seems to give the impression that he has prepared and knew it before hand. So it wasn't like he was reading it for the first time. So he actually summarised and picked it out so it was quite concise, and it was not going through it one point at a time just for the sake of it. In a sense it was just bom, bom, bom.

CBM Chair: So were there any other people that did that as well that you found helpful?

Fac. C: Um,

Fac. I: I don't think it's unhelpful even to go through it, not necessarily line by line, but

Fac. C: But it's probably a personal thing though, isn't it? You know, I am

Fac. I: But it's lifelong learning (laughs).

Fac. C: Yeah, but I know it.

Fac. I: Yeah, but there might be other things that come out, other questions that come out.

Fac. C: There might be, but there haven't been for me, really. It's very rare that I'm sat here, except for the renal, I've come away and thought, 'Yeah, I enjoyed that.' I'm trying to think what other experts we've had, actually.

The discussion continues about which blocks had case experts and which didn't.

CBM Chair: I think there are two levels of learning here: the one is the renal block, very interesting and we all learn. But then, there is also the learning at the level of the knowledge to facilitate it. In the sense to keep the groups going roughly in the territories so that for me they are doing levelled learning. And I guess that's what happens most of the time. The case is going southeast, and the experts add value to that (Unintelligible)?

Fac. C: I would find it helpful if we did more on 'These are the points that are to come out of this case.' And, maybe, 'These are the ways of bringing them in [unclear].' Rather than seeing it as learning about being able to, I don't think it matters if there's something that I don't understand, particularly. I'm a facilitator not a teacher.

CBM Chair: So you want to focus on facilitation?

Fac. C: Focus on the facilitation. Yeah, yeah.

(CBM RV 6_4, 28:12)

What becomes apparent from this extract is the range of views that facilitators hold regarding the need for content expertise, the need to be taught and the time spent developing and discussing issues relating to facilitation.

There is no consensus about whether the facilitators need to increase their content

expertise or whether they should focus on developing facilitation skills in order to attend to the group process. I would argue that by having case experts at the CBM there is an implicit expectation that facilitators need to have content expertise. This deviates from GEM's description of the facilitator's role (GEM, 2003a; GEM, 2003b). However, the data illustrates that it also provides facilitators with useful knowledge that may be used in practice.

6.4.2 Facilitators Teaching Each Other during CBM

Rather than solely relying upon a case expert, the facilitators may also share their expertise during the CBM. In the following excerpt, a facilitator is feeding back concerns about a PBL group's perceived misunderstanding about the normal values for Body Mass Index (BMI). In doing so, he actually demonstrates his own ignorance about the topic:

> Fac. B: Worryingly, the group that I'm with think that a BMI of 21 is quite normal!
>
> Fac. C: It is quite normal.
>
> Fac. D: It is.
>
> Fac. B: Is it?
>
> Fac. E: It's within the normal range.
>
> Fac. M: My group said it is within the normal range, but it is at the lower end of normal.
>
> Fac. B: What would the normal range be?
>
> Fac. D: 20 - 24.9. The point is you wouldn't expect the patient to be worried about her weight with a BMI of 21.
>
> (CBM 6_2 RV 6_1, 3:08)

This example illustrates how a facilitator may lack knowledge and mistakenly assume that the students' assumptions are incorrect. The CBM provides an opportunity for facilitators to educate each other. This is not simply the role of the expert briefing the case.

Sometimes facilitators using their expertise during the CBM to adjust information in the cases. The following example illustrates a health care professional using her knowledge to change a medication that had been included in a case:

> Fac. P: (Acting as the CBM Chairperson) Um, [Fac. C] What about the indapamide? Presumably not,
>
> Fac. C: No, I think this was in last year. It is something we use, but it wouldn't be our first choice.
>
> Fac. P: What would be our first choice?
>
> Fac. C: Bendroflumethiazide
>
> Fac. P: Can we put that in there?
>
> Fac. C: Yep.
>
> Fac. P: OK, so, um, past history. He's on an ACE inhibitor and then a diuretic, and the diuretic we want to use is, can you say that again?
>
> Fac. C: Yeah, I'm just spelling it out here (Writing on paper).
>
> Group: (Laughter)
>
> Fac. C: Bendroflumethiazide
>
> Fac. F: Can you spell that?
>
> Fac. C: It used to be bendrofluazide, but they've just changed its name. (Pause) B-E-N, D-R-O, F-L-U, M-E-T, H-I-A-Z (Interrupted by the case expert entering the room) I-A, H-I-A-Z-I-D-E.
>
> Fac. G: It would be the same dose as well.
>
> (CBM 6_2 RV 6_1, 14:26)

During a CBM I also observed numerous examples of facilitators raising questions that prompted further exploration of a topic. In the following excerpt, a facilitator raises a question as the meeting begins. This sparks the following discussion:

> Fac. O: (Acting as the CBM Chairperson) So, um, Bill Reynolds, William Reynolds, [unclear] Case 3, how's it going?
>
> Fac. E: I've just got one question about the haematuria. It's that the data suggests that he's got red blood cells in his urine four times the normal, but the urinalysis didn't pick that up. Is that because it is not sensitive to that amount or what?
>
> Fac. L: I was going to ask the same question (laughing). Does a dipstick pick up red cells? I mean, I assume that a dipstick picks up (unclear) haemoglobin. But does it pick up intact red cells? I don't know.
>
> Fac. B: [The case expert], the other day, suggested that when you saw blood or the other week suggested that when you saw blood, that it could be myoglobin or haemoglobin. But he, almost, sort of indicated that it wouldn't necessarily pick up red cells. That's how I read it.
>
> Fac. O: I've got a similar memory that the dipstick picks up, yeah, cells that have popped rather than intact cells. So in this case he's got intact cells on microscopy.
>
> Fac. E: Yes.
>
> Fac. O: I seem to remember that the cells are disrupted. Is that other people's memory?
>
> Fac. P: Would they be intact? In the urine?
>
> Fac. B: They would be a bit shrivelled, if it's
>
> Fac. E: (Unclear speech)
>
> Fac. B: They would pop or would they shrivel?
>
> Fac. E: They shrivel, do they?
>
> Fac. B: They wouldn't pop.
>
> Fac. E: Do they pop or do they shrivel then?

Group: (Laughter)

Fac. B: They should shrivel.

Group: (Unclear speech with numerous people talking)

Fac. L: You can see them down the microscope. They don't look particularly abnormal.

Fac. O: OK.

Fac. K: So that's why they didn't show

Fac. P: Pardon?

Fac. K: Why didn't they show on the dipstick?

Fac. O: I'm trying to think about the rationale for microscopic haematuria and why it doesn't show on the dipstick.

(The discussion continues for a few minutes)

Fac. B: [The case expert] definitely mentioned during the previous case that it was picking up the myoglobin from the dead and ruptured dead muscle cells.

Fac. K: So that's why they didn't show?

Fac. O: I'll just check on that.

Fac. E: OK.

Fac. P: [The case expert] certainly indicated the reason why it was very positive for blood in a previous case was that it was picking up the myoglobin which had come out from ruptured, dead muscle cells.

Fac. O: Well, um, we've got a learning issue.

(PBL CBM 6_4 RV 6_3, 00:57)

Here a facilitator raises a question that is immediately echoed by other facilitators at the meeting. This sparks a discussion about why blood that is seen when looking at the urine through a microscope is not detected on the urine dipstick test. This question creates a buzz of energy as the facilitators discuss what a dipstick actually

measures. They attempt to reason it out and raise more questions. The facilitators are sharing their pre-existing knowledge similar to a PBL group and mirroring the intended aims of PBL outlined in the curriculum specification (GEM, 2003a) and PBL Handbook (GEM, 2003b). The final statement, 'We've got a learning issue' may be an attempt by the chairperson to highlight the parallels between the facilitators' approach taken during the CBM to explore a question and those of their students during PBL.

The facilitators have created a supportive learning environment. However, one could question whether the knowledge they are exploring is necessary to successful PBL facilitation. Another view is that by engaging in this type of group learning, they are modelling an ideal PBL setting. There is potential value in that it again links closely with the theory of Cognitive Apprenticeship (Collins et al., 1989) that underpins Barrows' model of facilitation (Barrows, 1988). As highlighted previously, the facilitators' actions mirror what they hope the students will do during PBL, specifically, to work cooperatively to gain knowledge in order to understand the concepts within the PBL case. I do not mean to imply that facilitators should assume the role of students during CBM. Rather than by engaging in the practices of sharing their pre-existing knowledge and identifying gaps in their knowledge, the facilitators gain insight about what the PBL process looks like in practice. This may serve as a reference point during the actual sessions with the students. This could provide useful insight especially to the One-Blockers who facilitate intermittently.

6.5 The Personal Dimension of Facilitation

In addition to the professional differences, I also explore the various ways that facilitators relate to students in their groups. There is another dimension of facilitating PBL one that relates to what Heron describes as Charismatic Authority (1999). Within this section I share observations illustrating how the boundaries between the professional educator role and the personal work with students from PBL groups may blur.

The following extract is taken from the first PBL session a facilitator has with his group. The group has already been working together for two blocks. The facilitator is joining them for their final block together. The environment appears informal and relaxed (Bowman and Hughes, 2005). Students regularly make jokes and eat snacks during the session. The facilitator appears to fit into this informal environment and is also keen to get to know the students:

> Fac. A: Also, just to give me a bit of background, only if you want to, if you think it's got absolutely nothing to do with me.
>
> Group: (Laughter)
>
> Fac. A: Feel free to just say who you are and, maybe, also, just so I can get a feel for how the group is working, what do you think to PBL? How do you think it's useful?
>
> The facilitator first introduces himself (See Section 6.2.1) and then the students take turns going around the circle:
>
> SA3: Um, I am [name]. Um, I prefer being called [name] to most other things.
>
> Group: (Laughter)
>
> Facilitator: I won't ask what they are!

Group: (Laughter)

Three other students introduce themselves. A few minutes later another students takes her turn:

Fac. A: OK (pointing to next student),

SA6: Um, I'm [name] and I studied pharmacology but that was quite a while ago so that's not very helpful. Um, and since then I've done various things, worked abroad for a while and worked in clinical research for a couple of years. Um, and well, before I started here, as well as working in a nursing home, I was working at home on the family farm.

Facilitator: Great, is it a cereal or a livestock?

SA6: Livestock, it's a hill farm, so I'm quite good at the Obs and Gynae. (Laughter)

(Group A, PBL Session 1, 10:07:21)

This observation illustrates how facilitation involves more than simply guiding students through a series of steps to identify and learn about topics associated with the PBL cases and decisions about whether to share knowledge or a lack of it. While these are important components of facilitating, this observation sheds light upon another aspect: how facilitators build relationships with their groups. In this extract this facilitator first spends time introducing himself to the students and then dedicates time during the session to learn more about the students' backgrounds and experiences of PBL (See Section 4.7.4.1).

Time is dedicated to this practice at the start of a new block of PBL cases. As the facilitator may be the only new member of the group, it can help the facilitator get to know the students and how they have worked together during previous blocks.

This is an aspect of facilitating the social process within the group. It contrasts with this facilitator's experience of delivering a lecture to hundreds of students seated within an auditorium. Rather than speaking to students for 50 minutes, the facilitator spends between five and six hours working with a group of between six to eight students. It is not uncommon to learn more about the students' lives as observed in the extract.

Evidence of facilitators establishing and nurturing relationships with groups can be seen in other practices within GEM. Facilitators may adopt different strategies to adapt to working within this informal environment where students frequently eat, move around the room chat and make jokes during the sessions:

> Fac. O: I did try, and I came up, because I was really trying very hard with it, to think about the strategies I could use to, to enhance the group's learning and try and help them along the way. Between most sessions I had a plan of what I might do. Some of it was around things that we talked about at facilitator meetings so having a news round. I didn't call it that because they're not into all of this jargon and stuff. They were very anti-that. But we would sit down. And we would have coffee. And we would talk about life and things in general. Then after about 10 minutes, one of them would say, 'Oh, well. I suppose we're gonna have to start, you know, the real discussions.'
>
> (Fac. O, Interview, 77)

A 'news round' is a tool introduced at a CBM and modelled to facilitators during the meeting whereby the facilitator invites students to share good or bad news that happened since the group's last meeting. The following excerpt from a video-recorded observation illustrates this practice within a PBL group:

Five students are sitting around the table, and another one is seated in front of a computer. They are chatting and drinking coffee. The facilitator arrives:

Fac. E: Good morning team!

Students: (In unison) Good morning.

(Few seconds of silence)

Fac. E: I trust you all had a, an enjoyable and refreshing and relaxing and (pause) holiday? (The facilitator sets down his bag and begins to remove his jacket.)

SE4: Yes.

SE6: Yeah.

Fac.E: You didn't do too much work I hope.

SE4: No. How was your house, (SE7)?

SE7: Terrible! It's the most awful thing!

Fac. E: Oh yeah, how did the move go?

SE7: It's still going. It's like an epic move. It's been going for thr, what? Three, four days now and it's still going. Oh, it's horrible! So if I'm (the student flaps her arms), I have washed, but I couldn't find the shampoo to do my hair!

(PBL Group E, Session 2A, 08:01:37)

The conversation continues for approximately ten minutes during which the facilitator and students discuss a range of topics that include a magazine article about healthy breakfasts, the group members' views and anecdotes of giving high sugar foods to children, a television programme about controversies surrounding the combined mumps measles and rubella vaccinations. It finally meanders onto a comment one student made about PBL being a waste of time.

Practices associated with building relationships between facilitators and students can also extend beyond GEM. It is common practice for facilitators to join their groups when students organise a social event. Sometimes facilitators host a meal at their homes for the group. From my own experience, I have been invited to students' houses for 'PBL meals' where we have chatted, eaten and played games. During these informal gatherings, camaraderie develops within the PBL group of which the facilitator can be an integral part. A social bond can develop between facilitators and students even though they only work together for approximately 4 to 6 weeks.

Again these are examples of what Heron calls Charismatic Authority (1999). These occasions are focused on building relationships among the students and also with their facilitators. This practice normally involves sharing food and drinks and playing games. Bowman and Hughes draw attention to risks that could possibly arise from working within this informal environment and warn facilitators against engaging in these social practices and blurring their professional boundaries (2005).

While it is important to be mindful of these risks, it is important to also recognise the potential benefits gained by adopting this approach especially for facilitators attempting to assimilate into groups that have a history of working together.

Spending time in close proximity to the students during and/or outside PBL can open different lines of communication between educators and students. In the following extract, the students are discussing whether a topic (i.e. baroreceptor reflexes) was addressed within a lecture. The facilitator, who also gave this lecture to the students,

confirms the point was addressed. Interestingly, he also discloses future plans to delete the lecture from the timetable. This leads to an impromptu feedback session:

SB3: We did do regulation of blood pressure, like normal regulation of blood pressure.

SB1: We did. I remember a lecture entitled that.

(Brief silence)

SB5: Yeah.

SB2: We had a workshop on it as well.

SB5: But I don't think we did, like, baroreceptor reflexes.

SB3: We did.

SB1: We did, I remember going over it.

Fac. B: It was mixed in with that [provides lecture details].

SB3: I wouldn't have known what it was if we hadn't done it.

Fac. B: Which you'll be pleased to know has been deleted from next year.

SB3: (laughing) Aw.

SB2: What have you replaced it with?

Fac. B: Nothing just normal [specifies the subject].

(Silence interspersed with occasional chuckles of laughter)

Fac. B: You have to have a thick skin to work here.

SB3: Yeah.

SB2: Did you get a lot of abuse about that?

SB5: Did you get slated about that?

Fac. B: No, I don't, I didn't think it worked myself so I thought, 'Well I'll just get rid of that.'

SB3: I think that you're right though 'cos you

Fac. B: My plan was to, actually, to explain to people about [specifies theme].

SB2: Yeah, well that worked.

SB3: Yeah.

Fac. B: I tried to do that, right, but then I just overlaboured it a bit.

SB3: It is difficult though, isn't it? Because you always tend to hear, hear when people are unhappy and not when people think things are good. That's the way it always goes, but, yeah.

(PBL Group B, Session 1, 11:18:59)

The facilitator and students are engaging in an informal discussion about a lecture the facilitator gave. The facilitator is the one who steers the discussion and appears to show vulnerability to the group as he openly discloses his view of his lecture along with feedback he received. The students provide supportive feedback.

This observation is an example of the rich discussions that can take place within the PBL groups. While the topic digresses from the biomedical subject, it provides an opportunity for the facilitator to get feedback directly from the students. This example illustrates how an informal conversation can develop during PBL. It also provides unique insight into how facilitators build relationships with their groups. This informality provides a contrast to the social dynamic between educators and students within more formal settings like a lecture theatre.

However, this congenial relationship between the students and the facilitator is not universal among all the groups. This extract, that previously provided a 'Peek into

PBL' from Chapter 1, shows a facilitator quietly entering the room and then going unnoticed by some of the students:

> The students are between PBL sessions. Two students are huddled around the computer screen.
>
> SC5: Ready?
>
> SC4: Yeah (Music blasts from the computer, not a song but an upbeat guitar-picking tune.).
>
> SC5: I'll bet Pete will be glad he is recording all this.
>
> SC4: He'll be loving it!
>
> The students find another website that plays musical scales and repeatedly play them.
>
> SC6 (Leaning on a desk across the room): Is this week's case up yet?
>
> SC4 and SC5: (Laughter)
>
> A brief conversation takes place between another student and the facilitator.
>
> SC4 looks up from the computer: Oh, is (Fac. C) back as well?
>
> Fac. C: Yeah, sorry.
>
> SC4: Sorry, (Fac. C). I hadn't noticed.
>
> Fac. C: Sorry to interrupt.
>
> SC4: I just got over excited.
>
> The facilitator then sits quietly as the session begins.
>
> (PBL Group C, Session 1, 10:03:09)

This extract provides a contrast to the more pronounced entrance of the Facilitator E described previously in this section (See excerpt from PBL Group E, Session 2A, 08:01:37). While the exchange between the student and 'unnoticed' facilitator was

done in a joking manner, group dynamic appears to be less social when compared to that of Facilitator E.

Some facilitators find their group environment to be less inviting. During a CBM, a visiting facilitator (One-Blocker) made the following comment: Fac. S: 'You never quite know if you're just an intruder' (Field Note, CBM, 2006_05_16). The idea that the facilitator may feel like an outsider is understandable. Facilitators regularly rotate into groups where students have worked together for five to ten weeks. But the term 'Intruder' carriers a more negative tone, one where the facilitator is unwelcome in the group. Many facilitators, including myself, can find integrating into a pre-existing group to be challenging. It involves getting to know a new group of students and adapting to the group's approach to PBL. This challenge can be compounded when a facilitator is based outside GEM and occasionally visits to facilitate one or two blocks of PBL within an academic year. Therefore, feeling like an outsider is a normal part of rotating through groups especially when the students have already established a working relationship.

It is not only One-Blockers who may experience these feelings. The following extract was recorded in my field notes. It was added into my data due to the strong imagery it contains:

> During a CBM, Fac. U was sharing experiences of working with a new group. The group's approach to PBL sounded very different to the facilitator's.
>
> I mentioned, 'It sounds like you are suffering from culture shock!'
>
> Fac. U replied, 'Yes, I feel like a foreign body!'
>
> (Field Note, CBM, 2010_11_12)

During another CBM, a facilitator highlighted how students reportedly responded negatively to their previous facilitator's approach:

> Fac. H: Interestingly, the group this morning when we were talking about [their unique approach to PBL] said that they'd had facilitators in the past who kept interrupting them to bring them back onto a set format of what they should be doing. And they found that really offensive. So I just sit back and intervene very little 'cos they seem to get on fine that way.
>
> (CBM 6_3 RV 6_2, 13:20)

Here the facilitator highlights tensions that arose between the group's approach to PBL and the previous facilitators'. This appears to have shaped his style of facilitation, 'I just sit back and intervene very little.' The issue here is how groups can socialise their facilitators into their way of working with PBL. I observed other examples of this. This process may also occur when a new facilitator joins a pre-existing PBL group.

> Fac. A: If that seems to be the common theme about, maybe, losing focus during a particular session and going off on a tangent and talking about social stuff, would you expect me as facilitator to kinda say, 'Hold on a minute, you've got 18 different conversations going on here.' Or, the fact that you recognize it, that, do you control that yourselves?
>
> SA3: A bit but not enough. We've had two really different facilitators. Um, bef, we had [name] first and he was quite good at getting us focused but, but tended to concentrate a bit too much on detail. Um, and then we had [name] who just kinda let us get on with it really.
>
> Fac. A: OK.
>
> SA3: So, we've had two extremes really.
>
> Group: Yeah.
>
> SA3: Somewhere in the middle.
>
> Group: (Laughter)

Fac. A: So you want me to be in the middle of those then? I know I've got challenges.

(PBL Group A, Session 1, 10:17:25)

Within this extract the students guide the facilitator toward an approach that lies somewhere between the styles of the two previous facilitators, not too directive but not too removed. The students provide general guidance to the facilitator to adopt a more balanced approach.

Students may also communicate specific requests to their facilitators regarding their preferred style:

Fac. B: And what do you expect from me as a facilitator then?

(Silence for 2 seconds)

SB3: Just to make sure we cover everything on those sheets.
[Here the student is referring to the Facilitator Guide]

SB2: Yeah.

SB3: And don't miss any big things.

SB2: Yeah.

Fac. B: On what sheets?

SB3: On your (Pause), well,

SB2: The answers.

SB3: Yeah.

Group: (Laughter)

(PBL Group B, Session 1, 10:10:11)

Within this exchange, the facilitator invites the students to share their expectations. This illustrates how the practice of facilitation can be negotiated between the students and the facilitator. Sometimes the facilitators initiate these and sometimes the students do.

These extracts have attempted to highlight the social dimensions of facilitating PBL. The extracts have highlighted the benefits and challenges facilitators face when working with PBL groups.

6.6 Conclusion

This chapter describes the people and processes involved in the practice of facilitating PBL at GEM. What becomes apparent is that a diverse group of individuals with varying levels of knowledge and experience of PBL contribute in varying degrees to the practice of facilitating PBL at GEM. In contrast to Heron's concept of Tutelary Authority (1999), where facilitators possess expertise relating to both the knowledge and the educational processes to support students' learning, my findings demonstrate that some facilitators at GEM have limited levels of content and/or process expertise. This impacts upon their tutelary authority. This, in turn, presents another challenge to implementing PBL within GEM if as Heron suggests facilitators need to have expertise in both the content and process.

As discussed within the literature review, group process is highlighted as an essential component of PBL to promote the desired outcomes of deep learning. My findings

explore various factors that can impact on this. For example, facilitators' choices whether to share their knowledge or lack of it, a point highlighted in the Knowledge Sharing Matrix. Each facilitator faces choices around how to share their knowledge or lack of it within PBL sessions. The approaches facilitators use to guide learning are varied and range from teaching to nodding unknowingly to elicit student input and maintain discussions. It is also important to recognise the challenges facilitators face working with pre-existing groups. This results from the process of Asynchronous Rotation, which adds an additional layer to what is already a complex educational role.

Chapter 7: Reflecting on the Findings

7.1 Introduction

In this chapter I will summarise my research before moving on to discuss and explore the implications of my findings on practice. I also consider the strengths and limitations of my research. I conclude by suggesting areas for future research.

7.2 Summary of Research

7.2.1 Context of the Study

This research is set against the backdrop of undergraduate medical education in England. This has undergone numerous changes within the past decade. It has expanded in order to increase the number of doctors being trained. The recent increases in the number of doctors being trained in the UK has resulted in a number of newly established medical schools and programmes. Also, in an attempt to widen participation and access to medicine, graduate-entry programmes have been established.

Many of the schools have tailored their curricula to the recommendations made in Tomorrows Doctors, that has greatly impacted teaching and learning within undergraduate medical education. Medical educators face challenges relating to teaching graduate-entry students in new institutions using relatively new methods like problem-based learning with small groups of students.

Problem-based learning has become an established educational tool in medical education. As a result, the role of medical educators within undergraduate medical education has changed. More emphasis is now placed upon facilitating students' self-directed learning rather than solely transferring information from educator to student.

There is a loyal following of supporters singing the praises of PBL, but also some critics. As described in the literature review there are some key people and organisations, which have developed and established PBL and implemented it within medical education.

This study was undertaken at GEM, which is one of the new institutions established as part of the expanding medical training in England. It offers an 18-month undergraduate programme for graduate-entry medical students and links into the undergraduate course at the University of Nottingham for the clinical phase of study.

7.2.2 Background

I am a researcher who has also worked within my research setting as a PBL facilitator. Over the course of the research process my understanding of PBL, my understanding of the research process and my understanding of my educational role as a facilitator has shifted and developed. This is due to the interlinked influences of being a researcher and gaining theoretical insight and knowledge and also being a practitioner living the experience of facilitating PBL at GEM.

The initial driver of my research was to develop a how-to manual for facilitating groups. I wanted to become a better facilitator. However, as I progressed through conducting my research, collecting and analysing data from my observations and from my experiences as an ethnographer; my aims shifted toward exploring more basic questions: What happens during PBL? Is what I am observing on the videos and during PBL session reflecting the core aims of PBL? This reflects the way in which my research evolved and enabled me to gain an understanding of what happens during PBL and the process of facilitating PBL within GEM. My motivation to pursue these questions was fuelled by my experiences as an ethnographer. These have sustained my curiosity about the practice of PBL and the process of facilitation.

7.2.3 Overview of the Research

This doctoral research aimed to 'lift the lid' on the educational practices of a PBL-named medical programme. It is an ethnographic case study that set out to understand the practice of PBL within a hybrid curriculum used within the first two years of a newly established graduate-entry medical programme. The findings reveal descriptions of PBL that provide rare and unique insight into the practice of PBL and facilitation. Themes arising from the findings highlight the interplay between the intended principles of PBL and the practice of PBL. They also explore factors influencing the facilitation of PBL.

7.2.4 Literature Review

In the literature review the following questions are examined in depth to aid the critique of PBL at GEM: What is PBL? What is facilitation and what have researchers revealed about it? Has ethnography been used to look at PBL within medical education? If not, is there a rationale for using this method to look at the approach to PBL at GEM. What principles are intended to underpin PBL? What is self-directed learning? What is constructivist learning? What does it tell us about the practice of PBL?

In looking at the literature on the practice of PBL, key areas have been researched. However, I argued that the literature has the following gaps that I feel are important to address and have endeavoured to do so within my research, namely, what does a PBL-named course look like in practice through an 'ethnographic lens' (Parker and Ehrhardt, 2001)? How does PBL in my chosen research setting resemble PBL from both a theoretical standpoint and other research descriptions of practice?

7.2.5 Design & Methods

My philosophical framework aligned with interpretivism, although I originally came from a positivist stance. My evolving research strategy was based on qualitative methodology to allow an in-depth and open-minded exploration of the research setting. This also allowed inductive development of my research questions and the subsequent emerging findings.

I chose ethnography and case study approaches because there is a lack of research

studying the practices of PBL within the literature. I collected data via participant-observation, audio-visual recordings of PBL sessions and CBM and field notes, which included my observations, personal reflections and documents from GEM. Details of theoretical, practical and ethical issues that shaped my research design and methods are outlined in detail.

7.2.6 Findings

Over three chapters I present my data in two main ways. Firstly I provide an overarching description of GEM and contextual factors of PBL. This mainly derives from my observations as a participant-observer and from official documents describing the formal view of PBL at GEM. Secondly I focus on two broad themes arising from my audio-visual data and field observations: student's engagement with self-directed learning and how facilitators make sense of PBL at GEM.

My findings reveal variability in what occurs during the times allocated to PBL. Certain features are consistent with previously defined PBL and PBL described for GEM in the course manual and provide illustrations of PBL working well. However, I also found examples of when the students were not engaging in the process and the facilitators were caught between the aims of PBL and influences of the broader faculty-generated curriculum. I revealed the tensions between the stated aims of PBL at GEM, the aims of the students and the aims of the facilitators. I also showed examples of self-directed learning stimulated by the case that showed students demonstrating creativity, spontaneity and variety. I also highlighted ways in which the students became distracted from PBL and were seemingly motivated, not by the

process of learning for learning's sake, but by the pressures of assessment and the perceived need to acquire knowledge rather than to develop effective lifelong learning skills. This message is reinforced by the teaching practices that the students experience within the hybrid curriculum.

My study provides unique data about students' experiences of learning within a hybrid curriculum. Here PBL runs alongside the more traditional educational format found with medical schools (Sinclair, 1997). While PBL promises innovative educational approaches, it appears to be overshadowed by the more traditional curriculum when these approaches run side-by-side. I heard one student mention, 'It is difficult to be self-directed when you're being examined on the lecture material!' For medical students at GEM who are keen to progress to the next step in their training (the clinical phase), it is likely that passing the assessments will be their main focus. While it can be argued that PBL can benefit students in the long term by developing metacognition and deep learning, students may fail to see how PBL can help them pass their exams. This explains the observations in practice of students looking to access the 'answers' provided by the faculty rather than set and explore their own learning issues independently.

7.3 Exploring the Implications of the Findings

7.3.1 Self-Directed Learning

Self-directed learning is a core concept underlying both theories of facilitation and models of PBL. The data revealed several ways in which GEM and PBL supports students to be self-directed learners. These include the provision of suitable PBL cases; scheduled time for self-directed learning; organising students into PBL groups; providing a facilitator to guide them. Also, the official stated intention is to offer support to students via lectures, workshops and by creating learning resources. Students can choose to attend these non-mandatory additional components. PBL is highlighted within the course as being central to students' learning and attending the PBL sessions is mandatory. This official stance would suggest the centrality of PBL in the learning environment at GEM.

However, the data revealed ways in which self-directed learning may be compromised within PBL at GEM. There is a list of pre-determined learning objectives and learning topics that are mapped onto the PBL cases. As students have access to these during the PBL case, these provide the answers to questions that students would otherwise need to formulate and then research independently. 'What is this case about?' 'What is wrong with our patient this week?' While some students reason this from the clues provided in the PBL case, others simply access the learning topics or lecture timetable and make a well-informed guess. These tools that were intended to support students are being used in practice to direct students' learning. During PBL, students can develop an approach to learning where following directions takes precedent over students becoming self-directed.

This could be due in part to how learning is scaffolded. I recognise the need to support learners within PBL. However, when these resources are made available to students early on within a PBL case, students may use them for guidance and rely on these to direct their learning. In these situations, I do not feel that students are given the space to have a go and begin to develop a sense of independence that would enable them to be self-directed learners.

One of the challenges I have faced as a researcher and as a facilitator is that I do catch glimpses of self-directed learning in my observations and experience of facilitating. This evidence, where students appear to be taking responsibility for their learning, supports my belief that students can guide their learning in a self-directed fashion. I see students working well within PBL both in terms of trying to clinically reason through case material and engaging in discussions with other students to try and answer their questions and feeding back newly discovered knowledge in creative and engaging ways.

I also see them developing approaches to working that are productive and enjoyable, for example, learning in an environment where there is laughter and food. The students demonstrate a form of self-direction in terms of the culture that they create within the PBL session itself. Humour plays a strong part. Food plays a strong part. They may also choose to write songs to guide their learning or play games.

These approaches may reflect the diverse population of students selected to study at GEM. Each cohort contains a mixture of students with varying levels and types of knowledge and experience. For example, some students begin studying at GEM immediately after completing their undergraduate degree at university. Others, who have long since graduated have gained experiences through running a business, doing research or raising a family, may also draw upon these experiences during PBL to direct their learning. It is also important to recognise that this diverse population of students at GEM have all responded to challenges to get into medical school when, for whatever reason, they were unable or did not choose to study it during their first degree. This supports the notion that many of these students will possess self-directed learning skills when they begin the course.

What can frequently happen is that self-direction gets derailed by the hybrid curriculum that aims to promote it. Students are assessed in traditional ways of recalling information even though the curriculum specification claims that:

> 'The emphasis is shifted from memorising, 'knowing' and regurgitation for short-term assessment to reasoning through an understanding of mechanism.' (GEM, 2003a, p.17)

This criticism does not mean to imply that students do not need to be able to recall information they have learned. They obviously do. However, PBL aims to create a learning environment where students need to do more than recall their knowledge. They encounter problems that resemble clinical situations. These are intended to prompt students to move beyond recalling knowledge and onto applying what they know. Students may also identify the gaps in the group's collective knowledge and

highlight what information they require to engage with the clinical scenario. These deep learning and metacognitive skills move beyond recalling information.

7.3.2 Self-Directed Learning and Facilitation

Heron describes a 'radical change in the theory and practice of higher education':

> 'Teaching is no longer seen as imparting and doing things to the student, but is redefined as facilitation of self-directed learning ... In the new model, the primary responsibility [for learning] rests with the self-directing learner; and only secondarily with the facilitator.' (1999, p.2)

Here the concept of self-directed learning is an integral characteristic within the concept of facilitation. Brookfield reinforces this by describing 'The aim of facilitation' as 'the nurturing of self-directed, empowered adults' (1986, p. 11). Self-directed learning is a fundamental concept underpinning the facilitation of PBL. What my findings have demonstrated is that while facilitators play an important role in supporting students to become self-directed learners, they face many challenges.

One of these challenges is the hybrid curriculum within which they are practising. Outside PBL Sessions, the students are being instructed and taught via lectures and timetables. An important point to highlight is that these additional taught classes are intended to support the PBL process:

> 'The purpose of these classes is to complement the independent learning via PBL by providing overviews and orientation, exposition of difficult conceptual aspects and related practical experience.' (GEM, 2003a, p.7)

However, the extent to which these additional taught classes are intended to support the PBL process is variable: 'In some places students will be able to attain planned learning outcomes largely via the taught classes alone' (GEM, 2003a, p.7). Here we begin to see interplay between the PBL sessions and the taught classes within which students can rely upon the taught classes to supplement or even substitute the intended self-directed learning associated with the PBL case potentially undermines the proposed centrality of PBL.

This students' awareness that the facilitator holds the answers to the case is present from the moment facilitators join their PBL groups. This was illustrated in the extract when the facilitator was asking students about what they expected from him and they requested, 'Tell us what is on the sheets, the answers'.

7.3.3 GEM's Hybrid Version of PBL

The rationale for adopting a 'hybrid' form of PBL (i.e. a model within which PBL is supported by taught sessions (Barrows, 1988) is related to the shorter 18-month time span that GEM students have to 'attain vocational competence' compared to the undergraduates studying on the five year course in Nottingham who have 24 months to meet the learning objectives. A footnote in the Educational Policy and Curriculum Specification explains this:

> 'NB The GEM course manages the tension between the need for attainment of vocational competence (e.g. basic science outcomes) and the adult learning model underpinning PBL by using an epistemological version of PBL in a hybrid approach.' (2003a, p.6)

This hybrid model of PBL was felt to better suit the 'fast-track programme' (GEM, 2003a, p.7) at GEM as it was felt that students within a pure PBL curriculum may require more time to meet the intended learning objectives (Albanese and Mitchell, 1993).

Inherent in this are two assumptions. Firstly, that if only PBL (or self-directed learning) was used at GEM this would take longer than taught classes to achieve the same outcomes (that is cover learning objectives). This takes us back to the points raised in the literature review about students drowning in information and PBL being established to move away from the need for students to recall information. However, a tension exists (or contradiction) when talking about 'covering' information. If PBL aims to move away from information recall how can it sit comfortably in a setting where the faculty still organize the curriculum with this mind-set.

Secondly there is an assumption that the 'attain[ed] vocational competence' that comes from PBL or from taught classes will be the same. I would suggest that adult learning via PBL is about how to become lifelong learners and problem solvers rather than mainly a means to acquire facts and knowledge. The latter is an argument against traditional learning (via lectures, etc) in favour of adult learning (Barrows, 2000):

> 'With PBL being so labour-intensive and foreign to many teachers, it has to be mutually satisfying for students and their teachers if this approach is to survive and subsequently lead to further improvement in higher education.' (Boud and Feletti, 1997, p.92)

An assumption has been made (including by me) that PBL is being practised at GEM and at the outset I assumed that that is what I was going to research. What I found was a hybrid educational method at times more driven by the pressure of assessment and desire for knowledge acquisition rather than a desire to develop lifelong learning skills. There is variability in how facilitators and students use their PBL time and ways have been found to meet the students needs to 'get the right answers' while loosely following the prescribed PBL process. Students are seen to default to using faculty-generated resources and suggested learning topics rather than rely on their own perceived knowledge gaps and self-directed learning skills. The facilitators, in some part, 'collude' with the students rather than challenge them to try the PBL process. Sometimes the facilitators resist. However, they may still get worn down. The locus of control then returns to the students who harvest answers from the facilitator. The students are in the paradoxical situation of being on a 'PBL' course but are being assessed in a very traditional way on the basis of knowledge and skills acquisition. There is no assessment of how students perform in the PBL process or their ability to become self-directed learners. The taught components (e.g. lectures and workshops) are closely linked to the exam material.

Facilitators, the other part of the educational equation, are trying to fulfil a role that does not always match practice to the theory of PBL facilitation. The ideal of self-directed learning is eroded within a learning environment that is faculty-led and assessment driven. The students want to progress along the course and will adopt strategies to allow this. If the primary driver is being able to demonstrate knowledge acquisition that is dictated by the learning objectives listed on the faculty curriculum

then students may choose components of the course that they believe most closely map on to this. Currently at GEM, students may 'self-direct' their learning away from PBL. This complicates the facilitators' initial challenges of encouraging students to develop their skills as self-directed learners within the PBL process.

Does it matter? Maybe not. Students finish the course and go on to clinical studies. Other research is needed to look at long term outcomes such as clinical competence, diagnostic reasoning, metacognitive abilities and self-directed learning skills (yet to be further defined and beyond the scope of this exploratory research).

However, here are two main conclusions:

1. The GEM course is not a PBL course as described by key developers of PBL (Barrows, 2000). It could be reviewed and find ways to align the PBL-named components more closely with those proposed in the literature. Or it could abandon the PBL label.

2. I would propose a pure PBL course where students spend 6-12 months in a free-learning environment not driven by traditional forms of assessment but rather by formative assessments with an emphasis on developing skills in life-long learning. This course would not have lectures and workshops, unless they were established and driven by the students. Students would be encouraged to be creative in the range of learning strategies used and an emphasis would be on supporting and developing group process skills and the PBL skills formerly described by Barrows

(2000). This could be a pre-requisite to beginning on the full medical course.

If the PBL process could be re-defined or redesigned to support students' progression, then I believe students would engage more deeply with the steps of the process and its intended educational objectives like self-directed learning.

If this is the case, one way of addressing this would be to re-define PBL at GEM. The idea of developing students' skills as self-directed learners could by removed from the aims of PBL. It could be seen to be an assumption about PBL rather than part of PBL reflected in its practice. Removing this assumption would help to dissolve the tension facilitators may experience when working with students who are seeking to know what they are expected to be learning within a case. The tension arises because there is an expectation that PBL is assisting students to develop self-directed learning skills but some students and facilitators do not pursue this intended aim.

'Self-Directed Learning' could be replaced with 'active learning.' This would align with a characteristic of PBL offered by Margetson where PBL 'encourages open-minded, reflective, critical and active learning' (1997, p.39 in Boud and Feletti, 1997, p.92).

Students do appear to be active during parts of the PBL process. They engage with the trigger text, they feedback learning issues and discuss concepts that are highlighted in lecturers and workshops. The approach to redefining PBL challenges

the assumption that PBL does need to involve self-directed learning as a core educational objective.

Maybe it did when Barrows first began using it with students in clinical settings (1986). But maybe this doesn't apply when PBL is used with medical students at a different stage in training where how well they recall taught information largely determines whether they progress in their training.

7.5 Strengths of My Research

7.5.1 Methodological Strengths

My research set out to explore what happens during PBL sessions. I adopted ethnographic methods that are not widely used to study PBL within medical education. I collected data about PBL as it occurred in practice during PBL sessions. While the presence of the video camera may have changed the dynamic, I was also able to draw on the observations and experiences I had as a participant observer to validate what I observed from the audio-visual data. The excerpts I presented are not simply 'critical incidents' confined to specific groups at the time the data was collected. Rather the data serves to illustrate broader themes that are inherent to PBL practice at GEM.

The data I collected arose from a unique setting: a hybrid PBL programme that attempts to integrate students' self-directed learning with more traditional teaching from the staff members. How self-directed study occurs within hybrid PBL curricula

has not been widely researched (Blumberg, 2000).

7.5.2 Changing Practice

PBL at GEM has changed since I collected the audio-visual data. In September 2007, a new PBL curriculum was launched that replaced the PBL cases imported from Australia. Staff members at GEM have written new cases. The assessment process has also changed. Students previously sat their first summative exam at the end of the 18-month course. This exam assessed students on information across this time. Now students sit a summative exam at the end of their first year at GEM. Students must pass this exam in order to progress to the second year. More recently, the size of the groups has increased from seven students to eight students and rather than having 13 PBL groups the number has decreased to 12.

Also, due to pressure on space, groups from years one and two now share the same PBL room. This has been accompanied by installing PowerPoint projectors into the PBL rooms. The students did not have access to these when I was conducting my study. These changes provide new opportunities for further research at GEM.

However, some things have remained unchanged. Students still practice PBL within a Hybrid curriculum. They meet three times per week. They remain together as a group for 3 blocks while a new facilitator rotates through the group after each block. Questions that I have explored in my study about how PBL relates to self-directed learning at GEM and what challenges facilitators face in practice are still relevant. The tensions I have highlighted between self-directed learning and more didactic approaches can still be observed.

Other possible modifications to the PBL programme include increasing the sizes of PBL groups and implementing new models for feedback. More research is necessary at GEM to explore how changes like these may impact the PBL process.

The audio-visual recordings I collected capture PBL at a specific time. The data could provide a historical point of reference to explore how PBL practice has changed and how it has remained the same.

7.5.3 Asynchronous Rotation

In Chapter 4 I coined the phrase 'Asynchronous Rotation' to describe the practice of rotating facilitators through groups of students who continue working together. This creates an interesting situation where a facilitator may join a new group of students who have not yet worked together or, alternatively, a pre-existing group that has been working together for one or two blocks. During Year One a facilitator spends between four to six weeks with one group, which is the length of a block. During Year Two this extends to between four to eight weeks, as the blocks are longer. After

a block finishes, the old facilitators may be presented with a 'Thank you' card and/or a gift like a bouquet of flowers, a bottle of wine, a box of chocolates or a book[24]. As I shared an office with the Core Facilitators, I frequently observed them walking through the door carrying their gift. Other facilitators may ask, 'Did your group get you [those flowers]?' or facilitators may draw attention to presents they received, 'Look what my group got me!'

Coming back empty handed isn't necessarily something to hide. While it may be a reflection of a strained relationship between a group and a facilitator, it could also be due to none of the students organising a card or gift within the group.

During the changeover from one facilitator to the next, there is normally a break of 30 and 60 minutes between finishing Session 3 and beginning Session 1 with a new block of cases. During this period the outgoing facilitators say, 'Goodbye' and the new facilitators arrive.

Within this short space of time, this group becomes a new group or does it? The facilitator is the only new member and aspects of the old group remain. The students continue to have a shared history of working together possibly with a facilitator they enjoyed or didn't. There may be jokes made about situations arising during previous blocks or references to strains.

[24] I have received a cookbook from one group after baking an award winning lemon drizzle cake and The Shadow of the Wind, a novel by Carlos Ruiz Zafón.

As I've explored in Chapter 4, the facilitator may spend time 'starting the group.' This involves learning the students' names and trying to remember them. Students may share of background information like what subjects they studied at university, what work they have done and where they lived before moving to Derby along with their motivations for studying medicine. Facilitators may also try to obtain an understanding of how the students approach PBL. While groups work through the cases in a roughly similar fashion – Session 1: listen to the trigger text, Session 2: obtain a patient history and exam. The mix of individuals and their personalities results in each group having a different feel. They may choose to have a chairperson. Equally, the students look to understand the facilitator's approach or style. Are they hands off (i.e. sit quietly throughout the session)? Or do they frequently question the students or teach them? Inserting a new facilitator into a pre-existing group will undoubtedly change the way the group does PBL. What that change will be depends on the individual facilitator. Stepping back and looking at the aims of PBL, this raises some concerns. If the students are restarting each block and adapting to a new facilitator, does this support them to develop the skills that PBL intends to achieve like Self-Directed Learning and metacognition? Or do these skills take longer to acquire? Rather than providing them with a stable environment within which to acquire and hone these skills, they experience frequent changes of faculty. Could there be a better way to approach this that would be more flexible to administer and also support the aims of PBL? An important finding that arises from my research is how a seemingly minor detail like Asynchronous Rotation could cause repeated imbalance to the group's membership and dynamic. This, in turn, could then impede the aims of the PBL curriculum.

On the surface, this point appears to be simply a minor detail, nothing more than an organisational issue. For each block, there are between 12 and 13 groups that need 'cover.' Within GEM, each PBL group requires a facilitator. This pool draws upon a range of individuals: some of who are employed to facilitate, others who volunteer. Facilitators are selected from this mix and allocated to groups.

I highlighted earlier in the thesis that Barrows' suggests that facilitators spend at least 15 weeks with the same group. How closely this advice is followed in practice is difficult to assess as little work has been done in this area. A report from a meeting of PBL within the UK highlighted the practice of tutor hopping (McKendrie, 2010). This provided details from medical and veterinary schools using PBL. The practice of Asynchronous Rotation, while not called this, included tutors changing every block of cases (four to six weeks), to every semester (three months) to an extended approach where a facilitator remains with the same group of students for one academic year. To what extent this practice occurs within the United Kingdom and in other countries where PBL has been embraced requires further investigation. It is rarely mentioned within the literature. Neither are the various forms it may take in practice regarding the amount of time students spend together within a group and the duration that facilitators spend with groups. This can provide basic information regarding how PBL is structured and implemented within practice. While seemingly simplistic, this could provide a solid platform to better understand more complex educational theories that underpin PBL. This could ultimately help to thin the 'conceptual fog' that has surrounded PBL.

7.6 Limitations of My Research

One of the limitations of my research is that I collected my data within one medical school. Further research is needed to explore whether issues I have identified appear within PBL programmes within medical education.

PBL is being used across of number of healthcare or other disciplines within higher education and primary and secondary education. Therefore, more research is needed to understand how my findings relate to what happens during PBL within other settings

7.7 Ideas for Further Research

While conducting my PhD research, I have identified a number of areas that require further research. In reviewing documents pertaining to GEM and in listening to the audio-visual data, I started to ask questions about the discourses that exist within the setting. I suggest that my data could be used as the basis for discourse analyses. I wonder if the pervading discourses are impacting the role of PBL within GEM. Further questions for research include:

- What are these results/competencies demonstrated by students after spending time on a PBL programme like GEM?

- Does assessment of PBL provide evidence that students gain self-directed learning skills by taking part in PBL?

These questions require further investigation.

7.7.1 Further Research Relating to Asynchronous Rotation

Identifying the practice of Asynchronous Rotation opens many avenues for future research. When did it start being used and rationale as to why the practice has been adopted? What are the benefits and drawbacks? How are tutors prepared to establish relationships with pre-existing groups that align with the aims and intended practices of PBL? What are the participants (i.e. the facilitators, the students and course directors) opinions of the practice?

7.8 Becoming an Ethnographer

Conducting this research has greatly enhanced my understanding of research. When I began I saw research as conducting experiments and analysing statistics to establish proof. I now see things differently. Conducting this ethnographic case study has introduced me to a new ways of undertaking research where I can acquire understanding by observing people and through talking to them. Through it I have discovered ethnographic literature relating to my work as a Diabetes Specialist Nurse. This includes caring for people with Type 1 Diabetes (Mol, 2008; Mol and Law, 2004) and providing diabetes education via the DAFNE course (Hinder and Greenhalgh, 2012; Lawton and Rankin, 2010). I have incorporated this research into the teaching I provide to medical and nursing students and to health care professionals. I am excited to apply this approach within my work in healthcare provision and education.

7.9 Concluding Comment

I wonder whether self-directed learning and PBL can ever sit comfortably in a medical course where the emphasis is on getting students through by passing summative assessments based on knowledge acquisition. Medical educators have a responsibility to society to try to provide the best training to medical students to reduce the risk of under-performing or rogue doctors entering the profession. Doctors need to be safe, knowledgeable and operate with high ethical standards. Who ultimately holds responsibility for their education? Self-directed learning moves the responsibilities more towards the student but when should full student autonomy occur? Maybe it is appropriate for self-direction to be gradually acquired over the span of medical education, but only truly achieved once medical educators can be confident in students demonstrating fitness to practise after a self-directed learning curriculum.

Appendices

Appendix 1. Healthy Volunteer's Information Sheet

The University of Nottingham

University of Nottingham, Graduate Entry Medicine at Derby
Derby City General Hospital, Uttoxeter Road, Derby DE22 3NE.

Title of Project:
Exploring the Facilitation of Problem-Based Learning within
The Graduate Entry Medicine (GEM) Course at Derby

Name of Investigator:
Mr. Peter Jennings
(PhD Student School of Education, PBL Facilitator at GEM)

Name of Supervisors:
Professor Roger Murphy (School of Education)
Professor Joe Kai (School of Community Health Sciences)

Healthy Volunteer's Information Sheet

Dear Staff or Student,

You have been invited to take part in a research study. Before you decide whether to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with other colleagues/students. Ask me if there is anything that is not clear or if you would like more information. Please take time to decide whether you wish to take part or not. If you decide to take part you may keep this leaflet. Thank you for reading this.

Background
This study is being done as part of my PhD project which aims to explore the facilitation of PBL. The study is expected to begin May 2005 and finish in January 2006.

What is the project about?
Much of the research into the facilitation of PBL involves data collected before or after PBL sessions. As a result, there is a gap in research relating to what occurs during PBL. My research aims to explore and examine how facilitation occurs during PBL sessions. There are no direct benefits to you personally for participating in this study. However, this research may influence the training and professional development of facilitators. It may also influence how PBL is delivered to GEM students in future.

What will the researchers be doing?
I will take care to safeguard the anonymity and interests of those students and facilitators who agree to participate in the project. With your consent and your PBL group's consent, I will

- videotape you and your PBL group during one full PBL case (i.e. sessions 1, 2 and 3)
- observe and audiotape weekly PBL case briefings
- interview facilitators and students (individually and in groups) about their experiences in PBL Groups

What happens to the information you provide?
It will be used only for the research. Only the investigator and his supervisors will have access to the information recorded. I will not identify any individuals in the reports/papers I produce. You have the right to say that you would rather not take part, and you can see the videos which I have made or the notes I have taken, and veto the use of material which you are not happy about. The video record will not be used to inform the performance review of staff members nor will it be used to assess students' involvement in the course. The video records of staff and students will not be shown to third parties without the express agreement of those appearing in the video recordings.

Where can you get more information about the project?
The lead investigator will be available to answer any questions you may have relating to this project.

Why have you been chosen?

I am planning to recruit 8 PBL groups to take part in this study. Your involvement in PBL as either a facilitator or a student makes you eligible to take part.

Do you have to take part?
Participation in this research project is entirely voluntary. It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What if something goes wrong?
If you have any complaint about the research, you should initially approach the lead investigator and if no satisfactory outcome is achieved then he will put you in touch with the Chairman of the Medical School Ethics Committee and the Research Ethics Coordinator in the School of Education.

Lead Investigator:
Peter Jennings
PhD Student School of Education
PBL Facilitator at GEM

Email: peter.jennings@ nottingham.ac.uk
Telephone: 01332 724 640
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Chairman of the Medical School Ethics Committee:
Professor Robin Spiller

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Medical and Surgical Sciences
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School of Education
Jubilee Campus
Nottingham

Who is organising and funding the research?
The research is being organised by Peter Jennings as part of his PhD thesis.
No funding has been received for this research project.

Who has reviewed the study?
This study will be submitted for review by the University of Nottingham Medical School Ethics Committee and the Research Ethics Coordinator in The University of Nottingham School of Education.

Contact for Further Information
If you would like any further information about the study, please contact Peter Jennings. Email: peter.jennings@ nottingham.ac.uk Telephone: 01332 724 640
Room D48, The Medical School, Derby City Hospital, Uttoxeter Road, Derby, DE22 3NE.

Information Sheet v1, 5 May 2005

Appendix 2. Healthy Volunteer's Consent Form

University of Nottingham Medical School at Derby

Title of Project:

Exploring the Facilitation of Problem-Based Learning within the Graduate Entry Medicine (GEM) Course at Derby

The University of Nottingham

Name of Investigator:

Mr. Peter Jennings
PhD Student School of Education
PBL Facilitator at GEM

Email: peter.jennings@nottingham.ac.uk
Telephone: 01332 724 640
Internal Telephone: 24640

Room D48
The University of Nottingham Medical School at Derby
Derby City General Hospital
Uttoxeter Road
Derby
DE22 3NE

Healthy Volunteer's Consent Form

Please read this form and sign it once the above named or their designated representative, has explained fully the aims and procedures of the study to you

- I voluntarily agree to take part in this study.
- I confirm that I have been given a full explanation by the above named and that I have read and understand the information sheet given to me which is attached.
- I have been given the opportunity to ask questions and discuss the study with one of the above investigators or their deputies on all aspects of the study and have understood the advice and information given as a result.
- I authorise the investigators to disclose the results of my participation in the study but not my name.
- I understand that information about me recorded during the study will be kept in a secure database. If data is transferred to others it will be made anonymous. Data will be kept for 7 years after the results of this study have been published.
- I understand that I can ask for further instructions or explanations at any time.
- I understand that I am free to withdraw from the study at any time, without having to give a reason for withdrawing.

Name:.....

Address:.....

Telephone number:.....

Email:.....

Signature: ..... **Date:** .....

I confirm that I have fully explained the purpose of the study and what is involved to:

.....

I have given the above named a copy of this form together with the information sheet.

Investigator's Signature: ..... **Name:** .....

Study Volunteer Number: .....

Appendix 3. Confirmation of Ethical Approval

Direct line/e-mail
+44 (0) 115 970 9905
Louise.Sabir@nottingham.ac.uk

The University of Nottingham

Faculty of Medicine and Health Sciences

Medical School Research Ethics Committee
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26th May 2005

Mr Peter Jennings
PhD Student School of Education
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Dear Mr Jennings

Ethics Reference No: MA/5/2005 - Please quote this number on all correspondence
Title of Project: Exploring the Facilitation of Problem-based Learning within the Graduate Entry Medicine (GEM) Course at Derby.
Lead Investigator: Mr Peter Jennings
Co Investigators: Professor Roger Murphy, School of Education and Professor Joe Kai, School of Community Health Sciences

Thank you for your letter dated 9th May 2005 and enclosing the following documents for consideration:

- Application form dated 09/05/2005
- Protocol version dated 09/05/2005
- Volunteer Consent Form 09/05/2005
- Volunteer Information sheet version 4, dated 09/05/2005

These have been reviewed and are satisfactory and the study is approved.

Approval is given on the understanding that the Conditions of Approval set out below are followed.

Conditions of Approval

You must follow the protocol agreed and any changes to the protocol will require prior Ethic's Committee approval.

You promptly inform the Chairman of the Ethic's Committee of

(i) Deviations from or changes to the protocol which are made to eliminate immediate hazards to the research subjects.

(ii) Any changes that increase the risk to subjects and/or affect significantly the conduct of the research.

(iii) All adverse drug reactions that are both serious and unexpected.

Please note that all correspondence and queries should be sent to my Ethics Committee Secretary Louise Sabir

(iv) New information that may affect adversely the safety of the subjects or the conduct of the study.

Statement of Compliance (from May 2004 only)

The University of Nottingham Medical Research Ethics Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

Yours sincerely

Professor R C Spiller
Chairman, Nottingham University Medical School Research Ethics Committee

Please note that all correspondence and queries should be sent to my Ethics Committee Secretary Louise Sabir

Appendix 4. GEM Weekly Timetable

GEM YEAR ONE

Time	Monday	Tuesday	Wednesday	Thursday	*Thurs parallel*	Friday	Time
8.00				ECE Visit 1a *quarter of whole year*			8.00
8.30							8.30
9.00	Lecture 2	PBL Session 2 *13 groups*	Lecture 4		CLINICAL SKILLS Workshop 1 Group a	PBL Session 3 *13 groups*	9.00
9.30							9.30
10.00							10.00
10.30	Workshop Session 1 group 1		Lecture 5				10.30
11.00		Main PBL Staff Briefing Case Review Preview			CLINICAL SKILLS Workshop 2 Group b	PBL Session 1 *13 groups*	11.00
11.30							11.30
12.00	Anatomy Lecture 1	Lecture 3	Lecture 6				12.00
12.30							12.30
13.00					CLINICAL SKILLS workshop 3 Group c	PPD 2 General or Pastoral meetings	13.00
13.30	Workshop Session 1 group 2	Workshop Session 2 group1	Workshop Session 2 group 3 Or EBM				13.30
14.00						Lecture 1a Introduction to Anatomy	14.00
14.30	Workshop Session 1 group 3						14.30
15.00		Workshop Session 2 group2	occasional PPD 1 Seminars *(Most of these classes on Thursdays As part of CLINICAL SKILLS workshops)*	ECE Visit 1b *quarter of whole year*	CLINICAL SKILLS workshop 4 Group d	Lecture 1b As required	15.00
15.30							15.30
16.00							16.00
16.30							16.30
17.00							17.00
17.30							17.30

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